

17/12/98
commerce

ABACUS

A Journal of Accounting, Finance
and Business Studies

CONTENTS

Editorial

FORUM ON DEPRIVAL VALUE ACCOUNTING

A Modern Phoenix?

In Search of a Framework for Deprival Value and Other Purpose-Oriented Valuation Methods

Deprival Value and Optimized Deprival Value in Australasian Public Sector Accounting

Deprival Value in the Netherlands: History and Current Status

Deprival Value and Price Change Accounting in the U.K.

German Reflections on Asset Valuation

Wanted: Foundations of Accounting Measurement

The Influence of Regulation on the Publication of Consolidated Statements

The Earnings Smoothing Potential of Systematic Depreciation

The Evolution of Standard Costing in the U.K. and U.S.

Auditor Expertise and the Estimation of Dollar Error in Accounts



Published for the Accounting Foundation

University of Sydney

by

Blackwell Journals — Oxford and Cambridge, Ma.

EDITOR

G. W. Dean, University of Sydney

EDITORIAL BOARD

M. Abernathy, University of Melbourne
M. Bradbury, University of Auckland
P. Booth, University of Technology, Sydney
P. Brown, University of Western Australia
R. J. Chambers (Editorial Consultant),
University of Sydney
Chee Chow, San Diego State University
F. L. Clarke, University of Newcastle
A. T. Craswell, University of Sydney
R. Edwards, University of Cardiff
D. M. Emanuel, University of Auckland
J. Francis, University of Missouri
M. Gaffikin, University of Wollongong
P. Griffin, University of California, Davis
S. Henderson, University of Adelaide
D. Johnstone, University of Wollongong
D. Jukes, KPMG, Sydney

P. Luckett, University of New South Wales
S. MacLeay, University of Bangor
C. Nobes, University of Reading
R. R. Officer, University of Melbourne
R. Parker, University of Exeter
G. J. Previts, Case Western Reserve University
M. Scorgie, La Trobe University
K. Someya, Waseda University
A. Steele, University of Warwick
D. Stokes, University of Technology, Sydney
S. Taylor, University of Sydney
K. Trotman, University of New South Wales
A. Wagenhofer, University of Graz
T. Walter, University of Sydney
R. Weber, University of Queensland
G. P. Whittred, University of New South Wales
P. Wolnizer, Deakin University

ABACUS will be published twice yearly in 1998 and the annual subscription price is: institutions A\$115.00, individuals A\$55 (Australia); institutions £73, individuals £35 (Europe); institutions U.S.\$136, individuals U.S.\$76 (North America); institutions £82, individuals £46 (rest of the world). Subscriptions include delivery from Australia by surface air-lifted post. Canadian customers/residents please add 7% for GST. All subscriptions are supplied on a calendar year basis (January to December).

Business Correspondence All matters relating to orders and subscriptions and back orders should be addressed to Blackwell Publishers Journals, PO Box 805, 108 Cowley Road, Oxford OX4 1FH, United Kingdom. Fax: (44) 1865 381381 or by email: jnlinfo@blackwellpublishers.co.uk. Cheques should be made payable to Blackwell Publishers Limited. Back issues prior to Volume 26 can be obtained from The Editor, ABACUS, c/ - Department of Accounting, University of Sydney, N.S.W. Australia 2006.

INTERNET: For information on all Blackwell Publishers' books, journals and services log onto URL:<http://www.blackwellpublishers.co.uk>.

The journal is available on microfilm (16 or 35 mm) or 105 mm microfiche from the Serials Acquisitions Department, University Microfilms Inc., 300 North Zeeb Road, Ann Arbor, MI 48106, U.S.A.

COPYRIGHT: All rights reserved. Apart from fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988, this publication may not be reproduced, stored or transmitted in any form or by any means without the prior permission in writing of the publisher, or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency, the Copyright Clearance Center and other organisations authorized by the Publisher to administer reprographic reproduction rights. Electrocopying of all or any part of this publication is not permitted without the prior permission in writing by the publisher.

© Accounting Foundation, University of Sydney.

P 7741

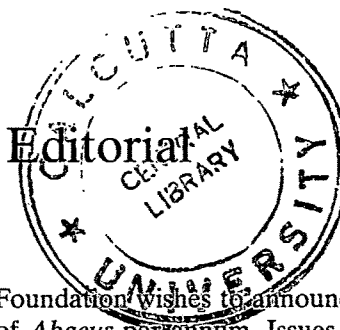
657
Ab.13

7

CUK-1102046-09 P007741

657

AB 13



The Council of the Accounting Foundation wishes to announce that, beginning in 1999, there will be three issues of *Abacus* per annum. Issues will be published in February, June and October. With a strong and stable readership, this initiative reinforces the position of *Abacus* as a leading international accounting journal, a position achieved over thirty-three years since its foundation issue under the editorship of Ray Chambers. Following Chambers' retirement, Murray Wells edited the journal for twenty years, from 1975 to 1994, before handing over to the current editor. Contiguous with this move to three issues, the Council has invited several new members to join the Editorial Board of *Abacus*. This enlarged Board creates increased editorial expertise and recognizes formally the efforts of many academics who have provided substantial *ad hoc* refereeing assistance in the journal's operations for many years. Another major change is the optional library delivery of *Abacus*, with *Abacus* being selected as one of Blackwell's journals currently being trialed for electronic library delivery in the U.K. and the U.S.A.

The following have joined the Editorial Board: Margaret Abernathy (University of Melbourne); Michael Bradbury (University of Auckland, Taranaki); Peter Booth (University of Technology, Sydney); Dick Edwards (University of Cardiff, Wales); Michael Gaffikin (University of Wollongong); David Johnstone (University of Wollongong); Peter Luckett (University of New South Wales); Stuart MacLeay (University of Bangor, Wales); Chris Nobes (University of Reading, U.K.); Bob Parker (University of Exeter, U.K.); Michael Scorgie (La Trobe University); Donald Stokes (University of Technology, Sydney); Stephen Taylor (University of Sydney); Alfred Wagenhofer (University of Graz, Austria); Terry Walker (University of Sydney); Peter Wolnizer (Deakin University).

This issue begins with a summary of a major symposium held at the 1997 European Accounting Association meeting at Graz, Austria, on the topical issue of the application of deprival accounting in the public sector. With repeated suggestions of the inefficiencies in the public sector and the consequent need to corporatize or privatize, this is a timely forum which discusses the way in which accounting can be a mechanism for shaping perceptions on such matters. Drawing upon the expertise of leading international accounting academics from several countries, the Graz symposium attracted a large audience and produced some controversial talks. The inclusion of a forum section will become a regular feature in one issue each year in the forthcoming three-issue format of *Abacus*. Immediately following the forum, Ray Chambers, founding editor of *Abacus*, examines the issue of accounting measurement. While the article was written (but never published) many years ago, it is timely given the mixed attributes (and their measurement and associated aggregation difficulties) that are discussed in the Forum as part of the deprival

value schema, as well as the current world-wide professional initiatives to grapple with the perceived measurement conundrum. With the present mix of cost and value methods of accounting world-wide, providing a logical answer to the measurement problem is crucial to the discipline retaining its professional status.

*Graeme Dean
University of Sydney
November 1997*

FORUM ON DEPRIVAL VALUE ACCOUNTING

G. W. DEAN

A Modern Phoenix?

This forum summarizes a symposium on price-level and deprival value accounting developments in several countries in the 1990s which formed part of the 20th Annual Congress of the European Accounting Association, held at Graz in April 1997. The symposium involved five internationally acknowledged speakers: Professor Richard Mattessich (Canada/U.S.A.), Professor Frank Clarke (Australia), Professor Geoff Whittington (U.K.), Professor Dieter Schneider (Germany) and Professor Kees Camfferman (Netherlands), with myself as chairman.

The catalyst for examining deprival was the increasing use of DV-type methods in 1990s public sector accounting initiatives of several countries. Recourse to the Camfferman, Whittington and Clarke summaries discloses the extent of DV use in the Netherlands, the U.K. and Australia in the private and public sector. Data provided by Schneider, Mattessich and Clarke provide an historical backdrop for the current use of DV-based accounting methods. Anglo-American readers will probably be surprised by Schneider's observation that the ninety-year-old German *Teilwert* concept predates either Limperg's or Bonbright's deprival value ideas. Further placing the discussion on DV in perspective are the ongoing 'measurement' exercises by professional bodies world-wide as part of their conceptual framework projects (Gore, 1995, and Chambers, 1996, provide contrasting summaries of those projects and their likely outcomes).

For example, in July 1994 both the Australian Accounting Standards Board and the Public Sector Accounting Standards Board announced plans for a joint 'Proposed Program for the Development of Concepts on Measurement of the Elements of Financial Statements'. Its purpose is to examine the impact of potential changes to the historical cost system of accounting both in the public and private sectors (and, in particular, the valuation of non-current assets). Then it was stated that the Concepts Statement was expected to be issued either in 1997 or 1998 (Accounting Communique No. 58, *The Development of Measurement Concepts*, 1995). This development followed persistent criticism of valuation practices in accounting over many decades. It coincided with a similar approach in the U.K. (see 1990s Accounting Standards Board discussion papers on valuation, 1993, 1996). In the 1980s many countries had produced reports by professional accounting committees suggesting that some form of market price accounting should replace the existing

historical-based system of corporate financial reporting. That was a dominant theme underlying the 1988 report of The Institute of Chartered Accountants of Scotland, *Making Corporate Reports Valuable*, prescribing market selling prices. In Australia, there is a discernible trend toward current values of one variety or another, marked-to-market moves in respect of accounting financial instruments being an example. For example, that even within Australia's so-called historical cost system of accounting many recent standards permit some current value basis of measurement (e.g., AASB 1010, AAS 25, AAS 26 and AASB 1023).

A similar story emerges in the U.S.A. The 1984 FASB Concepts Statement SFAC 5 provides background information. Therein, the relevant committee was unable to agree on a universally acceptable basis of measurement. Accordingly, its proposal contained a liberal specification of acceptable attributes to be measured:

Items reported in financial statements are measured [*sic*] by different attributes, depending on the nature of the item and the relevance and reliability of the attribute measured. The Board expects the use of different attributes to continue. Five different attributes . . . are used in present practice; historical cost (historical proceeds) . . . current [replacement] cost . . . current market value . . . net realizable (settlement) value . . . present (or discounted) value of future cash flows.

Further, several FASB Standards either permit or require current market values.

Current cost accounting (or its DV format) is one of the major valuation methods being considered within those measurement exercises. The appearance of DV as part of the preferred accounting method in public sector initiatives in various countries may be viewed as either a type of modern Phoenix (or as another panellist remarked, perhaps it is like a Hydra's head, depending on your assessment of DV's virtues). Whittington (1994, pp. 88–9) describes the current position in the U.K.:

Since the withdrawal of SSAP 16, U.K. financial accounting has typically represented an uneasy mixture of historical costs and current values, which the Accounting Standards Board is currently attempting to regulate (ASB, 1993a and 1993b) . . . Current cost itself is usually defined using the value to the business (VTB) method: choose replacement cost or recoverable amount, whichever is the lower. Replacement cost is defined as the cheapest possible replacement using a modern equivalent asset, and recoverable amount is the higher of net disposal price (NRV) or present value of the additional cash flows resulting from retention of the asset (PV).

The Graz symposium assembled leading scholars from around the world to examine matters pertinent to evaluating the use of DV in both private and public settings. This summary of their observations makes for informative reading. I commend readers to explore further the antecedents and current professional initiatives contained in this abbreviated account of the Graz forum.

The observations of the panellists confirm that DV has emerged as a major form of public sector reporting in several countries. A number of panellists, including Camfferman and Clarke, claim that there has been insufficient analysis of the appropriateness of current value in its DV form for public sector accounting. Society appears not to have learned the lessons of the failed attempts to implement CCA in the private sector in the 1970s and 1980s and it seems destined to repeat

A MODERN PHOENIX?

those experiences (including the dead ends and unwarranted expense) in the late 1990s and beyond.

REFERENCES

- Chambers, R. J., 'Ends, Ways, Means and Conceptual Frameworks', *Abacus*, September 1996.
- Gore, P., 'The Practical Use of Conceptual Frameworks for Financial Accounting', *Advances in International Accounting*, Vol. 8, 1995.
- Whittington, G., 'Current Cost Accounting: Its Role in Regulated Industries', *Fiscal Studies*, Vol. 15, No. 4, 1994.

RICHARD MATTESSICH

In Search of a Framework for Deprival Value and Other Purpose-Oriented Valuation Methods

The deprival value approach—introduced by Bonbright (1937)¹ as ‘value to the owner’ and later applied to accounting by Solomons (1966) and by Baxter (1971) as ‘deprival value’—is a kind of opportunity cost approach for financial statement presentation. But apart from its popularity (particularly in the U.K.), this approach is fairly pragmatic and takes only three values (replacement value, net realizable value, and present value) into consideration. Thus one may argue that it lacks generality as well as scientific foundation. The question of purpose-oriented valuation—which is broader than ‘deprival value theory’—has repeatedly been raised in the accounting literature; and purpose-oriented accounting (embedding valuation, realization and other issues) is a closely related but even bigger issue. Hence the prerequisite for a comprehensive scientific solution would be a framework in which all these problems can be accommodated. Nevertheless, valuation problems—figuring among the most basic issues of our discipline—have a certain urgency and cannot wait until a definite and fundamental solution can be found. This seems to be the very reason why such a practical solution as the deprival approach (that does not bother to ponder the underlying theoretical intricacies) has found wide, though not general, acceptance.² Yet this does not justify the reluctance to search for the overall framework mentioned above.

Although one repeatedly encounters in the literature the quest for different accounting models, suited to different information needs, there hardly exists agreement on how such a purpose-oriented theory can systematically be developed, and in which way the system structure can be matched to the pertinent information

¹ Though Whittington (1994, p. 254) points out: ‘Bonbright (1937) is the usual source of reference [of the origin of deprival value notion] for members of the LSE [London School of Economics] school [note omitted], but F. K. Wright (1964), in his classic paper on depreciation, derived his opportunity value principle (which is identical with deprival value) from Canning’s [1929] concept of “opportunity differences”’. Solomons (1966, p. 123) defines the ‘value of an asset to its owner’ as ‘the adverse value of the entire loss, direct and indirect, that the owner might expect to suffer if he were to be deprived of the asset’.

² The ‘deprival value’ continues to find considerable attention—see Fraser (1988), Hastie (1995), Bell and Peasnell (1996), the last named particularly in connection with the problem of depreciation.

objective. We seem to be in a dilemma: on one side, experts agree that so-called general purpose systems satisfy only very simple accounting needs; on the other side, many experts join opposing groups, each of which pursues only a single, one-sided objective. The major impediment to the development of such a purpose-oriented theory seems to be the 'arbitrariness' or '*ex cathedra* character' of most approaches to accounting—which Butterworth and Falk (1986), for example, criticize explicitly. However, to understand our objection to this criticism, it must be taken into consideration that the *foundations* of science in general are subject to a similar *ex cathedra* aspect. Furthermore, the justification for the use of any instrument lies in the fulfilment of its purpose. And the construction and evaluation of this instrument must begin and end with the purpose and the degree of its fulfilment within a long-range *cost-benefit* context.

To a modest degree, a purpose orientation for accounting has been available for a considerable time; the distinction between financial accounting and cost or managerial accounting is the most obvious example. But the objective-oriented program aims not only at a richer diversification but, above all, at a much better theoretical justification of its diverse categories and articulations as well as an appropriate methodology (for suggestions about the latter, see Mattessich 1995a, 1995b). J. M. Clark (1923) might be regarded as the father or precursor of such an objective-oriented research program; his slogan 'different costs for different purposes' sets the stage, and points in the direction which here is promulgated. Other authors who occasionally emphasized purpose orientation (in one way or the other) are: Le Coutre (1939a, 1939b), Lehman (1955), Mellerowicz (1956), Spacek (1962), AAA (1966), Backer (1966), Moews (1970), Heinen (1978), Chmielewicz (1981), possibly Schneider (1981, particularly on pp. 398 and 405ff.), Hamel (1984), and Devine (1985).³

Further publications about *objectives* of accounting are to be found by Stützel (1967), Beaver and Demski (1974), Cyert and Ijiri (1974), Cramer and Sorter (1974), above all the Trueblood Report of the AICPA (1973), FASB (1979), Stamp (1980, pp. 32–8), and Griffin (1982). And most recently Boritz (1994, p. 37) has stated that: 'However, there is unlikely to be a single set of measurements to suit all purposes. Which value/goals should accounting academe serve? Unfortunately, practitioners and standard setters have not been clear about their goals/motives/values, have not spoken with a united voice, and are not consistent cross-sectionally or longitudinally.'

Since the early 1960s I have attempted to bring some clarity into this particular 'objective-oriented research program' (e.g., Mattessich 1964, 1972, 1995b, pp. 153–5)

³ Schneider (1981, p. 392, translated), for example, writes: 'In the case of multi-period actions and under future uncertainty . . . due to restricted information-creating situations that cannot be uniquely observed, *one no longer knows what aspect of reality the accounting profit is supposed to represent*. One needs a theory of accounting purposes to determine the meaning of accounting income. Thus the accounting objective "income" must be preceded by the conception of an accounting purpose (a theoretical notion about relations manifested in reality).'

Special cases are the works of three notable Japanese scholars: Kurosawa (1932) who pleaded for *three different kinds of balance sheets*; Iwata (1954) who proposed *two different income determination models*, one with the emphasis on the income statement (for management decisions), the other on the balance sheet (for auditing work); and Kimura (1954) who emphasized that accounting cannot escape from *subjective* income measurement. See Edwards (1994), Chapters 9 to 11.

by distinguishing (within an axiomatic framework) between *positive* assumptions on one side, and *placeholder* assumptions on the other. The latter, so to say, keep place for instrumental hypotheses (formalized means–end relations) which have to be formulated and then chosen according to the context or information goal to be pursued. However, such an analytical scheme has to be complemented by the empirical research of determining an array of means–end relations. And it is this kind of peculiar empirical research which has not yet been forthcoming. Thus this theoretical endeavour took little root in the academic community despite the fact that the need for purpose orientation is often acknowledged in the literature and even materialized in actual practice. The standards on price-level adjustments (originally established but now abandoned) by FASB (1979, 1984a, 1984b), CICA (1982: *Handbook*, previous Section 4510), for example, resulted temporarily in greater purpose orientation of accounting systems of American business (since financial statements of many firms were required to reveal different values simultaneously—cf. Mattessich, 1995b, Chapter 6). These current cost accounting standards (supplementary to historical costs) were much more than mere inflation accounting; they also reflected shifting prices between commodities, and served other information purposes (above all, income measurement on the basis of different capital maintenance notions, e.g.: *nominal*, *real* financial or *physical* capital maintenance—each serving a different information objective and decision goal). However, the pertinent regulations of the FASB and CICA were abandoned after some five years or so.

Finally, for a comprehensive objective-oriented theory, it is not sufficient to establish the relation between an accounting system (including its hypotheses of valuation, realization, etc.), as the means, and the specific information goal, as the end. The connection between business goal (as an ‘end on a more basic level’) and the accounting system (which now becomes the ‘means on a more basic level’) too must be established. And this requires further means–end research, to which academic accountants do not seem to take easily.

REFERENCES

- American Accounting Association, *A Statement of Basic Accounting Theory*, AAA, 1966.
- American Institute of Certified Public Accountants, Study Group on the Objectives of Financial Statements, *Objectives of Financial Statements*, AICPA, Trueblood Committee, 1973.
- Backer, M., *Current Value Accounting*, Financial Executives Research Foundation, 1966.
- Baxter, W. T., *Depreciation*, Sweet & Maxwell, 1971.
- Beaver, W. H., and J. S. Demski, ‘The Nature of Financial Accounting Objectives: A Summary and Synthesis’, *Journal of Accounting Research*, Supplement, 1974.
- Bell, P. W., and K. Peasnell, ‘Another Look at the Deprival Value Approach to Depreciation’, *Working Paper of the International Centre for Research in Accounting, Lancaster University* (August 1996)—presented at the April 1997 Congress of the European Accounting Association in Graz.
- Bonbright, J. C., *The Valuation of Property*, The Mitchie Company, 1937.
- Boritz, J. E., ‘Comments for Workshop on Measurement Research’, in Ernst & Young Foundation, (ed.), *Measurement Research in Financial Accounting*, Ernst & Young Foundation and Waterloo University, 1994.
- Butterworth, J. E., and H. Falk, *Financial Reporting—Theory and Application to the Oil and Gas Industry in Canada*, Society of Management Accountants of Canada, 1986.

DEPRIVAL VALUE FRAMEWORK

- Canadian Institute of Chartered Accountants, 'Section 4510: Reporting the Effects of Changing Prices', *CICA Handbook*, CICA, 1982.
- Chmielewicz, K., 'Unternehmungsziele und Rechnungswesen', in E. Kosiol, K. Chmielewicz and M. Schweitzer (eds), *Handwörterbuch des Rechnungswesens*, C. E. Poeschel Verlag, 1981.
- Clark, J. M., *Studies in the Economics of Overhead Costs*, University of Chicago Press, 1923.
- Cramer, J. J., Jr., and G. H. Sorter (eds), *Objectives of Financial Statements*, Vol. 2, *Selected Papers*, AICPA, 1974.
- Cyert, R. M., and Y. Ijiri, 'Problems of Implementing the Trueblood Objectives Report', *Journal of Accounting Research*, Supplement, 1974, Studies on Financial Accounting Objectives.
- Devine, C., *Essays in Accounting Theory*, 5 vols, apparently to be expanded to 7 vols, American Accounting Association, 1985.
- Edwards, J. R., *Twentieth-Century Accounting Thinkers*, Routledge, 1994.
- Financial Accounting Standards Board, Statement of Financial Accounting Standards, No. 33, *Financial Accounting and Changing Prices*, FASB, 1979.
- , Status Report, No. 159, *Financial Reporting and Changing Prices*, FASB, August 1984a.
- , Statement of Financial Accounting Standards, No. 82, *Financial Reporting and Changing Prices: Elimination of Certain Disclosures and Amendment of FASB Statement No. 33*, FASB, 1984b.
- Fraser, I. A. M., 'Deprival Value or Value to the Owner?—a Clarification', *Abacus*, March 1988.
- Griffin, P. A., *Usefulness to Investors and Creditors of Information Provided by Financial Reporting—a Review of Empirical Accounting Research*, Financial Accounting Standards Board, 1982.
- Hamel, Winfried, 'Ansatzpunkte Strategischer Bilanzierung', *Zeitschrift für betriebswirtschaftliche Forschung*, November 1984.
- Hastie, L., 'A Matter of Appreciating Depreciation', *Accountancy*, December 1995.
- Heinen, E., 'Supplemented Multi-Purpose Accounting', *The International Journal of Accounting*, Vol. 14, No. 1, 1978.
- Le Coutre, 'Die totale Bilanz', in *Handwörterbuch der Betriebswirtschaft*, Vol. 1, 2nd. edn, C. E. Poeschel Verlag, 1939a.
- , *Grundzüge der Bilanzkunde—Eine totale Bilanzlehre*, 2nd edn, Wolfenbüttel, 1939b.
- Lehman, M. R., 'Die Quintessenz der Bilanztheorie', *Zeitschrift für Betriebswirtschaft*, 1955.
- Mattessich, R., *Accounting and Analytical Methods: Measurement and Projection of Income and Wealth in the Micro- and Macro-Economy*, R. D. Irwin, 1964 (reprinted in the Accounting Classics Series, Scholars Book Co., 1977).
- , 'Methodological Preconditions and Problems of a General Theory of Accounting', *The Accounting Review*, July 1972.
- , 'Conditional-Normative Accounting Methodology: Incorporating Value Judgments and Means-End Relations of an Applied Science', *Accounting, Organizations and Society*, Vol. 20, No. 4, 1995a.
- , *Critique of Accounting: Examination of the Foundations and Normative Structure of Accounting*, Quorum Books, Greenwood Publishing Group, 1995b.
- Mellerowicz, K., 'Bewertungslehre', in R. Sellien and H. Sellien (eds), *Dr. Gablers Wirtschaftslexikon*, Th. Gabler Verlag, 1956.
- Moews, D., 'Wertkategorien', in E. Kosiol (ed.), *Handwörterbuch des Rechnungswesens*, C. E. Poeschel Verlag, 1970.
- Schneider, D., *Geschichte der betriebswirtschaftlichen Theorie*, Munich: Oldenbourg Verlag, 1981.
- Stamp, E., *Corporate Reporting: Its Future Evolution*, Canadian Institute of Chartered Accountants, 1980.
- Solomons, D., 'Economic and Accounting Concepts of Cost and Value', in M. Backer (ed.), *Modern Accounting Theory*, Prentice-Hall, 1966.
- Spacek, L., 'Comments', in R. T. Sprouse and M. Moonitz (eds), *A Tentative Set of Broad Accounting Principles for Business Enterprises*, American Institute of Certified Public Accountants, 1962.
- Stützel, W., 'Bemerkungen zur Bilanztheorie', *Zeitschrift für Betriebswirtschaft*, Vol. 37, 1967.
- Whittington, G., 'The LSE Triumvirate and its Contribution to Price Change Accounting', in J. R. Edwards (ed.), *Twentieth-Century Accounting Thinkers*, Routledge, 1994.

FRANK L. CLARKE

Deprival Value and Optimized Deprival Value in Australasian Public Sector Accounting: Unwarranted Drift and Contestable Serviceability

A Common Genesis

General tinkering with replacement price values in Australasia has common origins with similar movements in Europe in the 1920s. Specification of current replacement values, reproduction costs and deprival values for public sector reporting draws heavily upon the use of concepts employed in the utility pricing debates in the United States during the latter part of the last century through the 1930s. Indeed, there are marked similarities in the politics of the current sector's current embrace of various concepts of replacement price as the infrastructure asset valuation base, and those of the U.S. utility debate from the *Smyth v. Ames* decision to the mid-1920s. This talk identifies the most notable of those similarities as it traces the entry of deprival valuations into the public sector in Australia and New Zealand.

Australasian Public Sector Monitoring

With one significant difference, the current push for valuing PTE assets on the basis of their assessed deprival value bears a remarkable similarity to the manner in which current replacement cost valuations first gained a foothold in valuation practice in respect of private sector enterprises. That one difference is a matter of direction—for whereas the original drift of ideas underlying replacement cost valuations was from a successful application in the utility pricing context to that of the non-utility companies in the U.S., the present drift has been from an unsuccessful application in the ordinary company context to that of the public sector utility entities. How the case for replacement cost valuations, promoted exclusively for one purpose, has drifted into an entirely different setting and has been presented as if it were the outcome of an evolutionary process, is repetitive. There is repetition also of the manner in which the theory underlying the development for its original purpose has been presented as if it were a development with the new setting in mind.

Current Cost in the U.S. Utility Fair Value Rate Base Context

Replacement cost valuations for utility asset valuations entered U.S. utility pricing formulae following the decision in *Smyth v. Ames* (1898), not as a basis for the

financial reporting or determining of a utility's financial wealth and progress, but as one of the myriad factors to be taken into account in setting the pricing rate base. Current cost of replacing the infrastructure did not enjoy any primacy; it was one of many asset valuations and financial estimates to which consideration was to be given by the court in determining a fair value basis for rate setting: the original cost of construction, the amount expended in permanent improvements, the amount and market value of its bonds and stocks, the present as compared with the original cost of construction, the probable earning capacity of the property under particular rates prescribed by statute (Bonbright, 1937, p. 1086).

Thus conceived, *the fair value rate base* was neither entirely factual nor entirely conjectural. It is interesting to note that notions of current replacement and reproduction cost shared that dubious status, too: an 'honest and intelligent forecast of probable future values', according to judgment in the 1923 Southern Bell Telephone case; such that 'can be established only theoretically . . . when applied to property of a public utility, purchased under conditions which no longer exist, and to property . . . that cannot be reproduced, it is not only theoretical, but highly speculative' in the Waukesha Gas Electric Company case; and in Glaeser's opinion (1927, p. 477), estimates thereof would be impossible of accomplishment 'without the aid of an Alladin's lamp'.

Unquestionably, both the notion of a fair value rate base and the ingredients comprising it lacked real world substance, something quite different from the commercial value and 'any value which businessmen have in mind when they decide upon a purchase' (Bonbright, 1937, p. 1086). Nowhere was this captured more eloquently than by Henderson (1920, p. 1051) in declaring that: 'The whole doctrine of *Smyth v. Ames* rests upon a gigantic illusion. The fact which for twenty years the Court has been trying vainly to find does not exist . . . As a practical concept, from which practical conclusions can be drawn, it is valueless.'

Fair Value Drift in the U.S.

Although the context in *Smyth v. Ames* was pricing of utility services, the prices utilities were permitted to charge for their services were inextricably linked to measures of their financial performance. For the utilities, the trade-off between their monopolistic access to the market and the limitations to engage in non-utility activities was sustained by the utilities' financial capacities to exploit their continuation to provide the utility service at the prescribed quality. Financial capacity depended upon their financial performance, financial performance was a function of the prices the courts permitted them to charge, and the permitted prices were in turn a function of the agreed costs taken into profit calculations and the agreed denominator (the rate base) which entered rate-of-return calculations. Essentially, the financial performance of the utility was manipulated according to the court's perception of the wealth needed for the utility's continued operation, somehow moderated by an assessment of how the resulting rate-of-return and the prices which were necessary to achieve it meshed with the court's perception of the public interest.

Parallel development of replacement price asset valuation schema in 1920s Europe, primarily by Fritz Schmidt and Theodor Limperg, were also in settings

somewhat different from the environment affecting U.S. companies in the 1920s. Schmidt's *Betriebswirtschaftslehre* was a response to the ravages of hyperinflation on the financial statements of German companies and particularly on the indexation mechanisms which were not company specific. Schmidt's mechanism did not merely entail the incorporation of specific price changes in accounts, but also countenanced an indirect adjustment for price-level changes through targeted managerial policy. And Limperg's *Bedrijfseconomie* was not specifically directed at external reporting. Rather, it was the internal management accounting arm of his business economics system (Clarke and Dean, 1990).

Against that background in the U.S. up to the early 1920s and a backdrop of hyperinflation in post-World War I Europe, the arguments developed specifically for determining the rate base for utility pricing drifted into the growing US debate on asset valuation in the context of non-utilities. Interestingly, no similar drift occurred in the U.K., where a utility pricing controversy had not developed in a parallel manner. U.S. utilities and private sector corporations enjoyed several distinctions: the utilities had specific privileges and restrictions which governed their operations—generally, they operated with an exclusive right and obligation to provide a utility service (gas, electricity, water and sewerage) of a specified quality, for a specified period in a specified area, at a price which arguably provided for their ongoing capacity to do so. Essentially, the U.S. utilities were non-adaptive enterprises, existing only to undertake the specific services for which they were established. In contrast, the emerging ordinary U.S. corporation—the business enterprise *par excellence* according to Paton (1922)—was essentially infinitely adaptive, capable of entering whatever fields of commerce (other than those which were in the domain of the utilities) their managers chose, with no guarantee of market share, no court-approved pricing regimes, no contracted specification of product quality, and no obligation to continue in operation. A case for replacement price asset valuation *drifted* into a general case for asset valuation for ordinary accounting purposes of the adaptive private sector enterprises. *Drifted*, for it appears more accidental than deliberately contrived. Virtually nowhere in the U.S. accounting literature mounting the replacement value case was there any justification for the recourse to the utilities' pricing literature. Nor, indeed, was there any acknowledgment of the special setting of the utilities' reference to replacement price valuations, their contiguity with the numerous other valuation bases and other factors stated in the *Smyth v. Ames* rate-base dictum, or any explanation of how the specific *Smyth v. Ames* setting was reconcilable with the general purpose setting of accounting for the performance of ordinary companies.

Bonbright's Value to the Owner and the Deprivation Context

Publication of Bonbright's *The Valuation of Property* (1937) and Hicks's *Value and Capital* (1939) two years apart was a significant coincidence in the background to the post-World War II pressure to introduce some form of current cost accounting. A selective recourse to Hicks's No. 3 *ex ante* concept of income as an authority for replacement price valuation of physical assets (Clarke, 1988, pp. 409–30) received a notable boost from the equally selective recourse to Bonbright's exposition of

value to the owner and the perceived authority it bestowed upon the replacement price case (Clarke, 1982, pp. 246–54). Again, contextual niceties were bypassed in the quest for a distinguished authority; for whereas Bonbright's context was the valuation of property of which owners had been deprived (by theft, fire, natural disaster, or expropriation for public use), Hicks's context was the calculation of the income of businesses not deprived of their property!

Bonbright's exposition referred explicitly to the principles enunciated in U.S. judicial proceedings determining the 'just compensation' to be paid to those who had lost, been deprived of, the access to and use of their property. According to Bonbright (p. 71): 'The Value of Property to its Owner is identical in Amount with the Adverse Value of the Entire Loss, Direct and Indirect, that the Owner Might Expect to Suffer If He Were to be Deprived of the Property'.

Value to the owner appears to have entered the accounting literature through engineers' concerns over the need to reserve funds for asset replacement (Burton, 1905; Matheson, 1910; Wyer, 1913; Martin, 1927) through depreciation charges against revenues. Notably, that arose in 1943 in a paper on depreciation bases presented by E. L. Grant (Stanford's Professor of the Economics of Engineering) at an American Society of Civil Engineers' symposium on the 'Fundamental Aspects of the Depreciation Problem'—the problem was the engineers' perceptions of difficulties attaching to maintaining productive capacity in times of rising prices. Grant drew on Bonbright's perception that the value (of property) to the owner generally reduced to its current replacement cost at the time of its loss, in support of his contention that depreciation ought to be based upon the current value of physical assets. Grant's paper was included in Solomon's *Studies in Cost Analysis* (1968), thus exposing accountants to the engineers' depreciation replacement fund doctrine.

Accountants' recourse to value to the owner has been noteworthy on two counts. First, those uses—physical asset valuation and income calculation for business entities not deprived of their property—were unrelated to the setting in which the concept had been developed and for which it had specific application, namely, assessment of compensation, financial indemnification, for individuals, business and non-business entities, in relation only to property of which they had been deprived. Similar to the recourse to the principles driving the utility rate base calculations, indemnification for property loss was treated as if it were a process analogous to that of conventional financial accounting and reporting. Second, recourse to Bonbright's value to the owner was, as in the utility case, pursued without due regard for the reservations implicit in Bonbright's explanation of it and explicit in the commentary of others. Accordingly, Bonbright's notion of deprival value was injected into the financial accounting regime in a manner far exceeding what could reasonably be described as a logical extension.

CCA's Failure in the General Purpose Accounting Context

It was not until the inflationary pressures in the mid-1970s that a general case for a full-scale introduction of replacement price accounting techniques for general-purpose reporting by ordinary companies was made. Faced with the prospect of high inflation, the British government appointed the Sandilands Committee to enquire

into 'whether, and if so how, accounts should allow for changes (including relative changes) in costs and prices'. After canvassing the perceived alternative mechanisms for incorporating the effects of price and price-level changes in accounts the committee recommended the introduction of a form of current cost accounting, in which calculation of periodic profits and losses was injected with the current replacement cost of inventories, depreciation based on the current cost of physical assets, and physical assets were to be reported in the balance sheet on the basis of their written-down value to the business—essentially their current replacement cost.

Similar proposals for various forms of CCA, in which adjustment only for changes in the current cost or replacement prices of assets featured, were presented in Australia (e.g., ASA/ICAA, 1976a, 1976b, 1978); New Zealand (Richardson, 1976); the United States (SEC, 1976); and Canada (Alexander, 1977). Clarke (1982) and Tweedie and Whittington (1984) detail those pronouncements.

Most importantly, whereas each of those initiatives underwent several iterations, none received unequivocal support from the respective national accountancy bodies as a means of general purpose reporting and none received general support from members of the profession at large. The failure of CCA in the general-purpose context is well documented (Clarke, 1982; Tweedie and Whittington, 1984; Whittington and Pong, 1996). While some of that failure to receive general endorsement could be attributed to the decline in inflationary pressures during the early 1980s, it also might be perceived to be a recognition that CCA is not an appropriate mode for the general-purpose reporting of financial data which are serviceable for performance monitoring.

Extensions of Bonbright's value to the owner accelerated during the 1950s and 1960s. Consistent with the context of assessing the compensation for property lost, but inconsistent with the context of accounting for property currently in possession, accountants gradually emphasized the deprivation aspect of Bonbright's definition. Merrett and Sykes were early to do so by explaining (1963, p. 466) that the value of a firm's property was the minimum or unavoidable financial loss an owner would incur by its disappearance. Wright (1965, p. 153) quoted Merrett and Sykes with apparent approbation, coining the phrase *opportunity value* to imply the least costly of the alternatives avoided by owning the assets. Baxter (1971) described the same notion as the deprivation value... the net outlay avoided by virtue of owning the asset. Thereafter, *opportunity value* (Solomons, 1966, pp. 127–31, though he used *cost* instead of value; Wright, 1967, pp. 74–5; Stamp, 1971, pp. 565–6; and implied by Sandilands, 1975, para. 209, p. 58; for example), and *deprivation value* (for instance, Edey, 1974, pp. 75–83; also implied by Sandilands, 1975, para. 208, p. 58; Richardson, 1976, paras. 5.07–5.14, pp. 339–40; and Bromwich, 1977, pp. 242–5), were firmly embedded in the accounting literature relating to the general-purpose reporting by ordinary companies.

None of those expositions notes the provisos which Bonbright attached to his use of value to the owner. And while there is no compelling reason for anybody to be constrained by logical extensions missing from an original explanation of a concept, due notice of caveats should be heeded if the original exposition is being exploited as authority for extensions of it. *Minimum or unavoidable and least costly* were not

part of Bonbright's definition—*Entire loss, Direct and Indirect*, was his prescription; nobody could be expected to settle for a compensation amounting to less than the actual loss sustained. Contestable extensions occurred at other points also: Baxter (1971, p. 36), for example, defined his deprival value as the lower of replacement cost or 'expected direct benefits'; yet Bonbright (1937) did not set expected direct benefits as a parameter. According to Bonbright, value to the owner meant that net selling price may often be assumed to measure the lower limit (p. 91), or the upper limit; or it could be that the value of property to its owner was its replacement price, or its selling price or some amount between these two figures (p. 92). Most significantly, he noted that his value to the owner is usually impossible to determine with confidence (p. 92). During the 1950s, 1960s and 1970s, the proponents of deprival value did not suffer any such reservations.

Paradoxically, whereas the *pre-* and immediate *post-*World War I debate (in the English language) on the use of current costs and replacement costs was almost exclusively an American phenomenon, the post-World War II debate (up to the 1960s) was predominantly between British accountants. And, whereas the 1920s fair value drift had been from the US utility rate setting context to that of the general purpose reporting by ordinary American companies in a setting in which replacement costs had been rejected as the dominant element of the fair value rate base, the 1980s/1990s drift of deprival value was from the general purpose context in which it had been rejected for general-purpose reporting in Australia, Britain and New Zealand into the context of British Commonwealth countries' utilities' rate fixing and performance monitoring.

Transportation of Deprival Value and Optimized Deprival Value into the Australasian Public Sector Accounting in the 1980s and 1990s

A perception that public sector enterprises were neither efficient nor competitive presaged the big push for replacement price valuation of public sector infrastructure in Australia. That episode is documented in Walker *et al.* (1997). But it will be instructive to revisit some of it here, for it is the outcome of the preconditions which, as we have just outlined, emerged over a fifty-year period.

Impetus for the current push for replacement price valuations of public sector physical assets—infrastructure assets in particular—lies primarily in the perception that the public sector was performing poorly relative to private sector enterprises. Such comparisons were somewhat misplaced, for whereas a few public trading enterprises were in competition with private sector enterprises in the same industry, most PTEs operated in public service industries and the so-called natural monopolies (in particular water and cognate services). In Australia, in particular, threats that the Commonwealth government was entertaining reductions of the states' shares of the income tax pool spawned the state governments' moves to make the PTEs more *commercial*. Underlying the commercial high-ground approach being presented to the public at large were the state governments' moves to top up their treasuries with compulsory dividends from their PTEs. Walker *et al.* (1997) note three phases of the commercialization movement: first, the publicity given to the alleged poor performance of the PTEs; second, injection of written-down replacement values in

the PTEs' accounts; third, formal implementation under an Australia-wide state government edict that replacement price values, and their rebadging as deprival values, be the official PTE asset basis.

Each of those phases was against a background of increasing government rhetoric that privatization of key PTEs would introduce the necessary commercial edge perceived to be missing. Of course, fiscal pressures world-wide were the catalyst for governments to support their treasuries through privatization—in Australia the Commonwealth Bank, Qantas and Telstra have been privatization targets. At the individual state level the water and sewerage, and the electricity generators and distributors, have been either corporatized or privatized. In New Zealand, electricity has been a prime corporatization and privatization target.

Rhetoric regarding PTEs' low rates of return compared to those of private sector companies highlighted the first phase. In 1982 the Victorian state government developed rate-of-return reporting guidelines for its PTEs. In its Department of Management and Budget (1986, p. 8) it explained that the government aimed to achieve an annual 'target real rate of return on assets of 4%', that PTE assets were to be 'measured' at 'written-down current value of assets-in-service', and that after deducting liabilities the public equity was to be the base for annual dividends of up to 5 per cent (similar, it is to be noted, to the U.K. targets; see the 1996 Report of the Independent Pricing and Regulatory Tribunal of New South Wales). The state of Victoria somewhat led the current value push—accordingly, for the financial years after 30 June 1986 many public authorities presented supplementary current cost statements designed to facilitate rate-of-return monitoring in keeping with the developing guidelines.

New South Wales spearheaded the second phase following the election of a Liberal (conservative) government. Particularly notable was the initiative to classify government agencies on the continuum—'government service' through 'commercial businesses' to 'commercial enterprises'. Upwards asset revaluations to reflect current values accompanied a new regime of rate-of-return monitoring and in compliance with N.S.W. Treasury guidelines that all the state agencies revalue assets at a 'current cost valuation measured by the lowest cost at which the service potential or future economic benefits of the asset could currently be obtained in the normal course of business' (N.S.W. Treasury, 1989, p. 9). Thereafter the N.S.W. PTEs undertook an undisciplined process of revaluations which witnessed massive oscillations in asset values, revisions upon revisions until, it seems, something like the 'right result' was achieved. Of course, underlying the PTEs' anxiety in that environment was the manner in which the upwards revaluations worsened their rates-or-return giving them the appearance of being even more relatively inefficient than originally alleged.

On that point Walker's (1993) analysis of the relative performance of PTEs and private sector enterprises is to be noted. It does not appear to have been realized by the commentators on the issue that the financial basis of the private versus public sector comparison was fundamentally flawed. For, whereas the PTEs were being assessed on the basis of the current costs of their assets, almost without exception the private sector enterprises had historical costs embedded in the denominator of

their rates of return; and whereas the PTEs were now charging depreciation on the basis of the inflated current cost valuations, the private sector enterprises were injecting amortization based on historical costs. Recalculating data for the water industry so that they 'conformed with private sector accounting treatments', Walker found that the Australian water industry PTEs returned 15 per cent on equity compared to the 9.4 per cent by ASX listed companies, earnings before tax of 12 per cent compared to 7.4 per cent, and had an earnings before tax as a percentage of sales of 44 per cent compared to the 9.5 per cent by the ASX companies. He also found that pre-tax and interest earnings per employee in selected water and electricity PTEs individually ranged from a multiple of three to five those of the average ASX-listed companies. And, whereas the inherent fragility of conventional private sector accounting treatments is to be noted and might well make Walker's data contestable, it even more so exposes the futility of the analyses of the data relied upon by those promoting the perception of the PTEs' relative inefficiencies.

In New Zealand the State Owned Enterprises Act transferred the assets of the electricity sector to Trans Power in 1994 on the basis of an established fair value as part of a large-scale corporatization process. The N.S.W. and Victorian state governments were planning similar projects (N.S.W. Pricing Tribunal Report, 1996, pp. 26–31).

A special meeting of Australia's state premiers in 1991 engineered critical developments in the PTE push towards current cost valuations. A national approach to PTE performance monitoring was agreed and a task force established to prepare a checklist of performance measures—'current (market) value' was the task force's preferred basis for the measurement of 'the assets of government' and a Steering Committee on National Performance Monitoring of Government Trading Enterprises was set up under the Commonwealth's Industry Commission to develop the performance-monitoring regime. The Committee's *Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises: Using Current Valuation Methods* (1994) formally prescribed CCA the preferred current value method for public sector asset valuation and rebadged CCA as 'deprival value', picking up on the way the salient Bonbrightish feature, 'loss that might be expected to be incurred . . . were that entity deprived', and noting that 'in most cases [deprival value] will be measured by the replacement cost of the services or benefits currently embodied in the assets'. Thus the Committee also embraced the Solomons' matrix, the (deprival) valuation depending upon whether the asset was to be replaced. Renewals accounting for infrastructure assets (which had some support in the U.K.) was prescribed.

Deprival value was given a further gloss in New Zealand. Drawing upon ideas (if not the name) in the 1986 U.K. Byatt Report, optimized deprival value was deemed to be the relevant concept; essentially, the ODV was to be an estimate of the current cost of the infrastructure assets required to produce the current (normal) output of a PTE's services (New Zealand Ministry of Commerce, 1994a, 1994b). ODV might be seen to be similar to the renewals accounting proposals of the 1920s (Bonbright, 1937; Clarke, 1982). Essentially, the objective of ODV is to quarantine the excess capacity from the infrastructure valuation and pricing base. In Australia

(and elsewhere, it appears) pricing through rate-of-return mechanisms based on denominators which included the costs of excess capacity has been a problem.

In Australasia, Australia in particular, those events have proceeded before a back-drop of political intervention to replenish the public purse: by driving arguments for corporatization and the ultimate privatization of public sector enterprises which draw upon a perceived inefficiency in the public sector; to promote accounting mechanisms which provide data supportive of compulsory dividend payments to state treasuries; and to evoke an illusion of a strict PTE monitoring regime.

Nowhere has that been more evident than in the work of the National Competition Review (chaired by Professor Fred Hilmer from the Australian Graduate School of Management), which also emerged from that 1991 Premiers' conference. The Hilmer reforms are to be implemented by the Steering Committee on National Performance Monitoring of Government Trading Enterprises. Whereas DV and ODV have a prominent place in the committee's monitoring regime, it is unclear whether they are measuring up to expectations. By 1995 the asset valuation rules had received wide dissemination, and the committee's 1996 report confessed its view that discontinuities in the data made comparisons 'infeasible'.

It appears that deprival value and optimized deprival value are now in the early stages of experiencing the disenchantment in the public sector that current cost accounting received in the private sector twenty years ago. Clearly those who have promoted the drift of both DV and ODV into the public sector have either not heeded that experience with CCA, DV and related concepts in the private sector, or did not know of it. If it is the former, then the public sector accounting reformers must be considered to suffer a certain lack of candour. And if it is the latter, they might reasonably be accused of lacking the efficiency and effectiveness they claim to hold so dear!

REFERENCES

- Alexander, M. O. (Chair), *Report of the Ontario Committee into Inflation Accounting*, Ontario Government Bookstore, 1977.
- Australian Society of Accountants and The Institute of Chartered Accountants in Australia, Draft Provisional Standard (DPS 1.1), *Current Cost Accounting*, 1976a.
- , Draft Provisional Standard (DPS 1.2), *The Basis of Current Cost Accounting*, 1976b.
- , Statement of Provisional Accounting Standards (PAS 1.1), *Current Cost Accounting*, 1978.
- Baxter, M., *Depreciation*, Sweet & Maxwell, 1971.
- Bonbright, J. C., *The Valuation of Property*, The Mitchie Company, 1937.
- Bromwich, M., 'The General Validity of Certain "Current" Value Asset Valuation Bases', *Accounting and Business Research*, Autumn 1977.
- Burton, F. G., *The Commercial Management of Engineering Works*, Scientific Publishing Co., 1905.
- Clarke, F. L., *The Tangled Web of Price Variation Accounting*, Garland, 1982.
- , 'Accountants' Use and Abuse of Hicks: The Power of Literature Citation in the Development of Ideas', *Economia Aziendale*, December 1988.
- Clarke, F. L., and G. W. Dean., *Contributions of Limperg and Schmidt to the Replacement Cost Debate in the 1920s*, Garland, 1990.
- Edey, H. C., 'Deprival Value and Financial Accounting', in H. C. Edey and B. S. Yamey (eds), *Debits and Credits, Finance and Profits*, Sweet and Maxwell, 1974.

DV AND ODV IN AUSTRALASIA

- Glaeser, M. G., *Outlines of Public Utility Economics*, Macmillan, 1927.
- Grant, E. L., 'Fundamental Aspects of the Depreciation Problem—Relationship to Competitive Industry', Paper No. 2203, *Transactions of the American Society of Engineers*, 1943.
- Henderson, M. S., 'Railway Valuation and the Courts', *Harvard Law Review*, 902 and 1031 at 1051, 1920.
- Hicks, J. R., *Value and Capital*, 1939; reprint, Oxford at the Clarendon Press, 1946.
- Merrett, A. J., and A. Sykes, *The Finance and Analysis of Capital Projects*, Longmans, 1963.
- Martin, R. O., 'Surplus Arising Through Valuation', *The Accounting Review*, June 1927.
- Matheson, E., *Depreciation of Factories, Mines and Industrial Undertakings and their Valuation*, Span, 1910.
- New Zealand Ministry of Commerce, *Handbook for Optimized Deprival Value of Electricity Line Business*, June 1994a.
- , *Handbook for Optimized Deprival Valuation of Trans Power*, Energy Policy Group, July 1994b.
- N.S.W. Treasury, *Accounting Guidelines for Reporting Physical Assets in the Budget Sector*, November 1989.
- Paton, W. A., *Accounting Theory: With Special Reference to the Corporate Enterprise*, 1992; reprint, Scholars Book Co., 1973.
- Richardson, L. M. (Chair), *Report of the Committee of Inquiry into Inflation Accounting*, Government Printer, New Zealand, 1976.
- Sandilands, F. E. P. (Chair), *Inflation Accounting: Report of the Inflation Accounting Committee*, HMSO, 1976.
- Securities and Exchange Commission, Accounting Series Release 190, *Amendments to Regulation S-X Requiring Disclosure of Certain Replacement Cost Data*, SEC, 1976.
- Solomons, D., 'Economic and Accounting Concepts of Cost and Value', in M. Bakker (ed.), *Modern Accounting Theory*, Prentice-Hall, 1966.
- Solomons, D., ed., *Studies in Cost Analysis*, Law Book Co., 1968.
- Stamp, E., 'Income and Value Determination and Changing Price-Levels: An Essay Towards a Theory', *The Accountant's Magazine*, June 1971.
- Steering Committee on National Performance Monitoring of Government Trading Enterprises, *Guidelines on Accounting Policy for Valuation of Assets of Government Trading Enterprises: Using Current Valuation Methods*, October 1994.
- Tweedie, D., and G. Whittington, *The Debate on Inflation Accounting*, Cambridge University Press, 1984.
- Walker, R. G., 'Evaluating the Financial Performance of Australian Water Authorities', in M. Johnson and S. Rix, eds, *Water in Australia*, University of New South Wales Public Sector Research Centre, 1993.
- Walker, R. G., F. L. Clarke and G. W. Dean, *The Use of Replacement Price Accounting to Shape Perceptions and Control the Public Sector*, paper presented at the 20th Annual Conference of the European Accounting Association, Graz, 1997.
- Whittington, G., and C. K. M. Pong, 'The Withdrawal of Current Cost Accounting in the United Kingdom: A Study of the ASC', *Abacus*, September 1996.
- Wright, F. K., 'A Theory of Inventory Measurement', *Abacus*, December 1965.
- , 'Capacity for Adaptation and the Asset Measurement Problem', *Abacus*, August 1967.
- Wyer, S. S., *Regulation, Valuation and Depreciation of Public Utilities*, Columbus, 1913.

KEES CAMFFERMAN

Deprival Value in the Netherlands: History and Current Status

The association between the Netherlands and current cost accounting is well known and needs little additional comment. But the fact that, at a theoretical level, Dutch current cost accounting is based on concepts of 'deprival value' or 'value to the owner', although it is documented in the English-language literature,¹ is probably less well known. This paper outlines the role of deprival value notions in Dutch accounting theory, regulation and practice. It argues that, presently, there is an imbalance in the sense that a well-developed infrastructure of accounting theory and regulation offers every scope for implementing deprival-value type concepts, whereas practical interest in such applications among businesses has strongly declined. Arguably, this situation has contributed to the apparent lack of direction on valuation issues in recent changes in non-business accounting.

The paper contains a sketch of developments in accounting theory until about the 1960s; the translation of these theoretical notions in theory and practice, culminating in the adaptation of Dutch law to the Fourth Directive in 1983; and finally, a review of the subsequent fate of deprival value notions in theory, practice and regulation.

Deprival value reasoning requires a number of value concepts which are known by a variety of names in Dutch and English. In this paper, Dutch value concepts will be referred to by English translations on the assumption that this will make the paper more readable for readers unacquainted with Dutch. The Appendix discusses the system of translations used. The English translations of Dutch concepts are identified in the text by double quotes. Apart from an occasional deliberate anachronism, this will allow the reader to identify precisely which Dutch concept is being referred to.

The Emergence of Deprival Value Notions in Dutch Accounting Theory (c. 1920–c. 1960)

It is well known that the development of "replacement value" accounting in the Netherlands is closely linked to the efforts of Theodore Limperg. His first known forays in the area of alternatives to historical cost accounting date from the 1910s, when he was active as a practising auditor and in that capacity much interested in cost accounting questions of his clients. In articles written during that period,

¹ See for instance, van Sloten (1981), Clarke and Dean (1990) and Camfferman and Zeff (1994).

he opposed the tendency to interpret the task of cost accounting as a meticulous attaching of actual expenditure to products or departments. He stressed that relevance for decision making, rather than a strict allocation of historical expenditure was the norm for cost accounting. Decision relevance might entail the introduction of what he at that time called 'fictitious amounts' into the accounts, such as current costs or costs adjusted for the influence of temporary price fluctuations.² There is no evidence that Limperg had at this stage developed a distinct theoretical basis for these recommendations.

Limperg's practice-based notions were elaborated during the 1920s, when he had stopped practising as an auditor to become a professor at the new faculty of economics at the University of Amsterdam in 1922. There are a number of studies in the English-language literature in which the nature of his value theory is outlined (e.g., van Sloten, 1981; Camfferman and Zeff, 1994). In this context it is important to note that the theoretical justification for "replacement value" accounting was that it followed from a more fundamental value theory in which value was defined in a value-to-the-owner or deprival value sense. In contrast to Mattessich's representation of deprival value as a practical concept requiring a wider theoretical perspective of purpose-oriented valuation, Limperg regarded his deprival type theory as providing just such a theoretical foundation for the practical notion of "replacement value" cost accounting, which by the early 1920s had already been introduced in the Dutch literature. Limperg presented himself not so much as a proponent of "replacement value" accounting, but rather as the creator of a general value theory which had as a practical implication that "replacement value" would usually, but not always, be the proper basis of accounting. In addition to "replacement value", Limperg's value concept included two value concepts corresponding approximately to net realizable value and present value³ and the reasoning to determine which of the three value concepts applied to particular assets was similar to that outlined in Solomons (1966). There are some echoes of the German legal *Teilwert* literature referred to by Schneider in the Dutch literature (notably Volmer, 1914), but Limperg himself merely acknowledged a debt to the economists Menger and von Böhm-Bawerk (see Camfferman and Zeff, 1994, p. 117). Throughout the 1950s, the German rather than the English-language literature served as a point of reference to Dutch academics discussing the valuation and income determination theory.⁴ His value theory was probably substantially complete well before 1930,⁵ and certainly so by

² See van der Schroeffer (1959), van Seunter (1975) and Camfferman (1994) for further discussions of Limperg's early work.

³ Despite the general correspondence, there was no clear indication in Limperg's work that his counterpart to present value, "indirect benefit value", involved discounting of future benefits. As indicated below, the concept was refined to include discounting later on.

⁴ See, for instance, the repeated characterizations of Limperg's reasoning as based on the *Verlustgedanke* in van Straaten (1957).

⁵ In a private letter dating from 1953 (kindly made available to the author by Professor J. W. Schoonderbeek), Limperg himself would later claim that he had taught his complete value theory as early as 1922.

the appearance of Bonbright's 1937 work, *The Valuation of Property*, that is often indicated as the source of deprival value notions in the English-speaking world. It would have been interesting to know Limperg's reaction to Bonbright's work, but there is no indication that he (or, for that matter, any other pre-war Dutch academic) was aware of it.⁶

An issue that was often commented on during Limperg's lifetime was the relationship between his ideas and those of Schmidt. In particular, the originality of Limperg's ideas was questioned (See Clarke and Dean, 1990, and Camfferman, 1994, for some more recent discussions of this issue). From a deprival value perspective it is interesting to note that, in discussions of this issue, Limperg and his students attached much importance to the absence of a tripartite deprival type value concept in Schmidt's work:

The theory of "replacement value" as developed by Limperg is not a monistic theory in the sense that it recognizes only "replacement value" as valuation basis (as with Carey or Schmidt). Essential for value judgments are its two^[7] value concepts: "benefit value" and "replacement value", which are coordinated value concepts in the sense that they must be viewed in their mutual relationship. (van der Schroeffer, 1959, p. 559)

It is certainly open to question whether Limperg and his students were justified in the weight they attributed to this difference, but in the present context the important point to note is that, to them, the deprival type theory underlying Limperg's "replacement value" recommendations was one of the central features of the doctrine rather than some subordinate aspect.

The Introduction of Deprival Value in Practice and Accounting Regulation
(c. 1950–c. 1985)

As indicated in Camfferman (1994), although Limperg's advocacy of his theory was an important factor in the spread of knowledge of "replacement value" accounting in the Netherlands, it was by no means the only factor. Schmidt's work was also rather widely known and by the late 1930s "replacement value" accounting was a common element in the accounting courses of universities and professional training programs. However, especially in the latter, "replacement value" accounting was typically not taught together with the Limpergian theoretical background in which "replacement value" was just one element of a three-pronged value concept.

This educational background may explain why, on the one hand, "replacement value" accounting was adopted on a considerable scale in accounting practice, while, on the other hand, there was in such cases usually little attention paid to the deprival value connotations. As one of Limperg's students put it: 'Increased

⁶ There are no references to Bonbright in Limperg's work. An inventory of Limperg's private library, recently acquired by the Dutch Institute of Registered Auditors (NIVRA) does not list Bonbright's book. There appear to be no copies in the libraries of economics faculties other than those of the 1965 reprint.

⁷ As indicated in the appendix, Limperg used an intermediate value concept, "benefit value", which was defined, in effect, as the higher of net realizable value and net present value. Valuation was then reduced to determining the lower of "benefit value" and "replacement value".

attention and application do not imply that justice is always done to the theory of "replacement value". Time and again one is struck by the fact that the theory is expounded and practised in a way that is not in keeping with its basic foundations' (van der Schroeffer, 1959, p. 558). Between the early 1950s and the early 1980s, the number of companies using some form of current cost data in their financial statements grew steadily from about 10 per cent of listed companies to more than 50 per cent (see Camfferman, 1997, pp. 271–87). Taxation relief on the basis of current cost accounting was certainly extensively discussed (as a clear parallel to U.K. developments outlined by Clarke), but ruled out by the tax authorities in the 1930s and again in the 1950s. This factor can therefore not have been of great importance in the increased use of current cost accounting in the 1960s and 1970s.

In many cases, current cost applications were rough-and-ready affairs consisting of, for instance, charges for 'supplemental depreciation' with few explanatory notes, or of partial applications in which, for instance, buildings only were revalued. In general, current cost applications were characterized by a great diversity in practice. During the 1950s and 1960s there were no legal regulations on valuation and income determination, nor were there accounting standards that might have provided concrete guidance in applying alternatives to historical accounting. Hence, it could be concluded on a basis of interviews with company managements that 'the majority of companies [applying "replacement value"] are struggling to solve the difficulties involved in determining the "replacement value" of tangible assets' (Klaassen, 1975:196).

During the 1970s, however, some regulatory support was provided. In 1970, the first modern accounting law was enacted.⁸ Although the law did not prescribe any particular valuation basis, the parliamentary record clearly indicated that current cost applications with a solid theoretical foundation were looked on favourably. When, starting in 1971, a set of non-binding accounting standards⁹ was developed in the Netherlands to elaborate on the legal requirements, it could be assumed that "current value" was certainly legally acceptable, and by 1976 the standards contained both a stated preference for "current value" over historical cost in the main financial statements and a quite extensive set of practical guidelines on the application of "current value" accounting.¹⁰

In these recommendations, a pragmatic approach was advocated to choosing among the alternative value concepts constituting "current value". Whereas in theory a comparison of all three values was necessary to determine the appropriate valuation, in practice it could be assumed that assets were to be valued at "replacement value" unless it was clear that the assets would not be replaced. Such a situation would be indicated by a management decision on replacement or a situation of

⁸ *Wet op de Jaarrekening van Ondernemingen* (Act on Annual Financial Statements of Enterprises), see Zeff *et al.* (1992, pp. 148–84).

⁹ See Zeff *et al.* (1992, chapters 5–6).

¹⁰ *Beschouwingen naar aanleiding van de wet op de jaarrekening van ondernemingen*, No. 5, December 1976, notably Ib.3.6 and Ib.4.

'lasting negative results' for the enterprise (or business unit) as a whole. In such cases, assets would be valued at, in effect, net realizable value ("direct benefit value") in case of immediate termination or net present value ("indirect benefit value") in case of delayed termination. It was also accepted that "indirect benefit value" could be determined with a considerable margin of uncertainty only and only for a group of assets or a business unit as a whole, and that allocation of this value to individual assets was unavoidably arbitrary. This pragmatic approach in which, for most practical purposes, "current value" equalled "replacement value" had already been foreshadowed in earlier theoretical work (e.g., van der Schroeffer, 1959, p. 559) and was met with approval by even the strictest of Limperg's students (Groeneveld, 1979, pp. 190–2, 245).

This understanding of "current value" was given legal status when Dutch law was adapted to the Fourth Directive in 1983. According to Article 33 of the Directive, member states were given the option to allow current cost systems or price-level accounting as alternatives to the historical cost basis provided that the application of such alternative systems was regulated. In the Netherlands, this provision was implemented by recognizing "current value" as the single, though optional, legal alternative to historical costs. Rules on the application of "current value" were broadly modelled on the lines of the earlier reporting guidelines in which the fate of the assets determined the value rather than the other way round.¹¹

Current Status of Deprival Value Notions in Theory, Regulation and Practice

The incorporation of "current value" into law in 1983, after decades of experimentation on a voluntary basis, was a clear indication of the high degree of acceptance it had achieved. Acceptance was not universal, though, as was indicated by the strong and successful resistance aroused by proposals, made during the preparation of the new law, to make "current value" accounting mandatory rather than optional (see Zeff *et al.*, 1992, pp. 297–305). With hindsight, it is probably justified to interpret this resistance as an indication that the acceptance of "current value" accounting was nearing its high-water mark. This section outlines how, during the approximately fifteen years that have elapsed since then, "current value" accounting has lost its hold over the imagination of Dutch accounting academics, auditors and company managements. This background is then used to discuss the lack of direction in recent attempts to determine the role of "current value" notions in non-business accounting.

As to Dutch listed companies, there has been a steady decline in the practice of "current value" accounting.¹² Whereas by 1986, 54 per cent of listed companies applied some form of current cost accounting in their primary financial statements (even if only for limited classes of tangible assets), by 1994 this had fallen to 34 per cent, representing mainly partial applications. A mere handful of companies applied current cost accounting to all classes of tangible assets. In terms of theoretical

¹¹ Besluit Waardering Activa, 22 December 1983.

¹² For the following facts, see Brink and Langendijk (1995).

refinement, there was a similar decline. In 1985, 6 per cent of companies used "current value" accounting in combination with a gearing adjustment, while in 1994, gearing adjustments were no longer in use. The reasons for this development are partly similar to those cited by Whittington (1998) for the U.K., notably falling inflation rates and difficulties in application. A typical factor for the Netherlands seems to be the growing desire of the larger Dutch companies to conform to accounting practices of the English-speaking world.¹³

In the accounting literature, valuation and income determination issues had played an important role prior to around 1970, with a prominent place for what was known as the 'normative-deductive' type of reasoning exemplified by Limperg. During the 1970s and 1980s, these issues and the way in which they were traditionally approached began to lose their appeal to researchers (see Feenstra, 1991), presumably because of changes in reporting practices and because of changing patterns in international research activity. For example, one of the most frequently used textbooks in the Netherlands started life in 1985 as a monograph on valuation and income determination, discussing various forms of inflation accounting and current cost accounting. In the most recent edition, these discussions have been relegated to an appendix while the main body of the book is concerned with the topics that characterize mainstream financial accounting textbooks in the English-speaking world.¹⁴

Against this background, it is understandable that the current value tradition has made its impact only weakly felt in developments in reporting regulation during the 1990s. The current value provisions in company law, introduced in 1983 and described above, are still in place. The Dutch accounting standard setting body has even, in 1992, introduced some further clarifications in its guidelines by elaborating on the use of discounting in the calculation of "indirect benefit value" although, as seen above, there was only a handful of listed companies left which used the current value basis of accounting.¹⁵

A significant development in accounting regulation during the late 1980s and 1990s is the attempt to create more unity in the financial reporting practices of non-business entities by restating the accounting regulations for these entities to conform as much as possible to the legal regulations applying to companies. This development occurred (and continues) in a context of privatization and decentralization in which institutions such as public utilities, schools, universities, non-profit private-sector housing societies and regional police organizations either saw their link with public finance severed altogether, or had their regime of cost reimbursement changed to a system of lump-sum budgets coupled with a periodic rendering of account. In all cases, a more businesslike type of financial reporting was felt to be appropriate.

¹³ The latter argument played a prominent role in the decision of Philips, for decades the most prominent Dutch company to practise current cost accounting, to revert to historical costs in 1992. See Schatke and Vergoossen (1996).

¹⁴ The first edition referred to is Klaassen (1985); the most recent edition is Klaassen and Bak (1996).

¹⁵ Raad voor de Jaarverslaggeving, *Richtlijnen voor de Jaarverslaggeving vanaf 1990*, 2.02.212, May 1992.

As the legal requirements for company financial reporting still allow the option of using "current value" accounting in accordance with the regulations of 1983, in each case a decision had to be made to determine the extent to which the 'non-business' sector in question could or should use this type of accounting. Unlike Australia and New Zealand, where similar issues have been openly discussed in research reports or other papers, there has been little or no attempt at coordination in the Netherlands. A factor may have been that, again unlike Australia and New Zealand, "current value" accounting has for many decades occupied such a prominent position in education and regulation that further study was believed to be unnecessary. But whatever the reasons, this approach has resulted in a considerable variety of accounting regulations and practices coming into being under the auspices of quite a number of independently operating ministries and other supervisory bodies. The following examples may be mentioned:

- Public utilities, when operated as a limited liability corporation, are subject to the ordinary company regulations and therefore the option of using "current value" accounting is open to them (or to their owners who, in most cases, are municipal or provincial governments). The result is a wide variety in accounting practices. In 1994, 44 per cent of a sample of utilities used some form of "current value" accounting in the main financial statements, which compares to 34 per cent among listed companies (see above). Whereas none of the listed companies used a gearing adjustment, 18 per cent of the utilities that used "current value" also used a gearing adjustment, giving rise to the suspicion that in this way a justification of high rates could be combined with high distributable income (Berghouwer *et al.*, 1996). In the light of government plans to continue the deregulation of energy and water supply, sporadic concern has been expressed in the press about opportunistic accounting practices by utilities, and it is likely that in the near future the issue of "current value" accounting by utilities will have to be addressed more systematically.
- Non-profit housing societies until recently had access to government financial support which has now been terminated. Henceforth, such societies (which own a very large proportion of the stock of rented housing in the Netherlands) need to attract private-sector funding although they can still benefit from certain government guarantees. Being independent, these societies are by and large allowed to choose their own reporting policies subject to the legal requirements relating to company financial reporting which have, with minor exceptions, been declared to be applicable. "Current value" accounting is therefore a legal option. The Dutch accounting standards-setting body (see note 9) has provided additional (non-binding) guidelines in which a preference for historical cost accounting is stated, as 'being more in keeping with the characteristics of the social housing sector'.¹⁶
- The financial reporting guidelines for universities (which, in the Netherlands, are largely dependent on state funding) have been revised in 1995 with the explicit

¹⁶ Raad voor de Jaarverslaggeving, *Richtlijnen voor de Jaarverslaggeving vanaf 1990*, 3.61.205, April 1997.

goal of ensuring a greater conformity with company accounting requirements.¹⁷ In these (mandatory) guidelines, "current value" has explicitly been ruled out as valuation basis for tangible fixed assets. However, at the same time a mandatory supplemental depreciation charge has been introduced to make sure that total depreciation is adequate for the needs of future replacement, taking into account the planned use of external funding. This use of expected replacement cost with a future-oriented gearing adjustment seems to ensure that, at least in this respect, the objective of greater conformity to company reporting practices will not be met.

- The newly (1994) created regional police organizations were required to revalue their initial endowments of buildings to "current value", while the revaluation reserve created in this way was to be released into income in keeping with depreciation.¹⁸ This seems to be a somewhat complicated approach to arriving at a historical-cost income figure, in danger of creating the illusion that future replacement is ensured as long as net income does not become negative.

In all, it seems that "current value" accounting has become so well established both in theory and in the legal reporting requirements for companies, that it cannot be dismissed out of hand when considering norms for non-company reporting. On the other hand, the decline of interest in "current value" in business settings has apparently resulted in uncertainty about the desirable extent and manner of its application in a non-business environment.

Conclusions

Taking the perspective of a theorist, the following observations may be made concerning the present situation. First, the theoretical apparatus of "current value" accounting has, for a long time, been well developed, and the way in which "current value" accounting has been included as an option in the legal reporting requirements for companies seems to be as good a model as one can hope for of legislating on a combined basis of accounting theory and practical experience. Second, it seems that companies (and, in their wake, Dutch accounting researchers) have for the last decade been voting with their feet against this option. One may deplore both the apparent fruitlessness of earlier efforts to promote "current value" accounting, and that it cannot be ruled out that fashions have played at least as large a role as convictions in this change, but this does not make the end result unacceptable. The undeniable difficulties encountered in implementing and spreading "current value" accounting and its comparatively swift decline have opened our eyes to the limitations of normative-deductive theory in guiding the development of reporting practice. Third, what does seem to be unjustifiable is the apparent lack of a coherent approach to the issue of "current value" accounting in the non-business sector. There seems to have been no concerted effort to draw lessons from the ultimately unfavourable attitude of business. The various regulations give the impression of

¹⁷ Richtlijnen verslag (jaarrekening) en begroting voor instellingen van wetenschappelijk onderwijs, 13 December 1995. These guidelines replaced an earlier, 1991, version.

¹⁸ Besluit Comptabele Regelgeving Regionale Politiekorpsen, Staatsblad, 1994, 264.

as many *ad hoc* choices, sometimes leading to possibilities of opportunistic accounting policies, sometimes resulting in figures which even the entities involved have difficulty in interpreting.

REFERENCES

- Bonbright, J. C., *The Valuation of Property*, The Mitchie Company, 1937.
- Berghouwer, M., H. L. Brink and H. P. A. J. Langendijk, 'Toepassing van actuele waarde bij nutsbedrijven', *Tijdschrift voor Bedrijfsadministratie*, January/February 1996.
- Brink, H. L., and H. P. A. J. Langendijk, 'Actuele waarde in de jaarrekening', in H. L. Brink and L. G. van der Tas (ed.), *Jaar in Jaar uit 9*, Kluwer, 1995.
- Camfferman, K., 'Schmidt, Limperg and the Dissemination of Current Cost Accounting in the Netherlands', *International Journal of Accounting*, Winter 1994.
- , *Voluntary Annual Report Disclosure by Listed Dutch Companies 1945–1983*, New York: Garland Publishing, 1997.
- Camfferman, K., and S. A. Zeff, 'The Contributions of Theodore Limperg Jr (1879–1961) to Dutch Accounting and Auditing', in J. R. Edwards (ed.), *Twentieth-Century Accounting Thinkers*, Routledge, 1994.
- Clarke, F. L., and G. W. Dean, *Contributions of Limperg and Schmidt to the Replacement Cost Debate in the 1920s*, Garland, 1990.
- Feenstra, D. W., '25 jaar externe verslaggevingstheorie', *Maandblad voor Accountancy en Bedrijfs-economie*, June 1991.
- Groeneveld, G. L., *Waarde, winst en jaarrekening*, Kluwer, 1979.
- Klaassen, J., *De vervangingswaarde, Theorie en toepassing in de jaarrekening*, Samsom, 1975.
- , *Het meten van vermogen en winst*, Stenfert Kroese, 1985.
- Klaassen, J., and G. G. M. Bak, *Externe Verslaggeving*, 4th edn, Stenfert Kroese, 1996.
- Schattke, R., and R. G. A. Vergoossen, 'Barriers to Interpretation—a Case Study of Philips Electronics NV', *Accounting and Business Research*, Winter 1996.
- Schroeff, H. J. van der, 'Limperg's theorie van de vervangingswaarde', *Maandblad voor Accountancy en Bedrijfs-economie*, December 1959.
- Seventer, A. van, 'Replacement Theory in Modern Dutch Accounting', *International Journal of Accounting*, Vol. 11, 1975.
- Sloten, P. J. van, *The Dutch Contribution to Replacement Value Accounting Theory and Practice*, ICRA Occasional Paper No. 21, University of Lancaster, International Centre for Research in Accounting, 1981.
- Solomons, D., 'Economic and Accounting Concepts of Cost and Value', in M. Backer (ed.), *Modern Accounting Theory*, Prentice-Hall, 1966.
- Straaten, H. C. van, *Inhoud en grenzen van het winstbegrip*, Stenfert Kroese, 1957.
- Volmer, J. G. Ch., *De winstrekening en de vermogensbalans*, Delwel, 1914.
- Whittington, G., 'Deprival Value and Price Change Accounting in the U.K.', *Abacus*, March 1998.
- Zeff, S. A., F. van der Wel and K. Camfferman, *Company Financial Reporting: A Historical and Comparative Study of the Dutch Regulatory Process*, North-Holland, 1992.

APPENDIX

ON THE TRANSLATION OF DUTCH VALUE CONCEPTS

The wording used in this paper has been chosen in an attempt to do justice to:
(a) the general correspondence of the deprival value concept as found in the

English-language literature with notions from Dutch accounting theory, and (b) the difference in wording between Limperg's original formulations and the concepts as used presently in Dutch legislation.

Until the 1970s, it was customary to refer to "replacement value" theory, even though it was well understood that this in fact implied a pluralistic value concept of which "replacement value" was merely the most common manifestation. During the 1970s it became common to refer to the overall value concept as "current value", even though a Limperg student argued that 'as an indication of "replacement value" theory, this concept is inexpedient, leads to a permissiveness in application that is not in keeping with "replacement value" theory and causes confusion' (Groeneveld, 1979, p. 191).

Below, approximate equivalents have been grouped horizontally. It may be noted that Limperg used an intermediate value concept, "benefit value", defined as the higher of the equivalents of present value and net realizable value, and which apparently has no equivalent in the English literature. Confusingly, the Dutch name for this concept ('opbrengstwaarde') is currently used to designate the equivalent of net realizable value.

<i>English</i>	<i>Limperg</i>	<i>Current Dutch usage</i>
value to the firm	"value"	"current value"
value to the owner	(waarde)	(actuele waarde)
deprival value		
(current) replacement cost	"replacement value" (vervangingswaarde)	"replacement value" (vervangingswaarde)
—	"benefit value" (opbrengstwaarde)	—
present value	"indirect benefit value" (indirecte opbrengstwaarde)	"operational value" (bedrijfswaarde)
net realizable value	"direct benefit value" (directe opbrengstwaarde)	"realization value" (opbrengstwaarde)

GEOFFREY WHITTINGTON

Deprival Value and Price Change Accounting in the U.K.

The CCA Experiment, 1980–6

In 1980, the U.K. Accounting Standards Committee introduced a current cost accounting (CCA) standard, SSAP 16, which applied to the larger U.K. companies. After initial success, with high compliance rates, it lost support and was withdrawn in 1986.¹

SSAP 16 had 'value to the business' as its valuation base. This was based on deprival value, although for practical application it did not require an exact calculation of discounted present value in assessing recoverable amount, and the use of indices was permitted in estimating replacement costs. The capital maintenance concept was operating capability, so that depreciation and cost of sales were measured on a current cost basis and holding gains were not included in the profit and loss account. Supplementary adjustments, of a controversial type, were made to profit and loss to reflect the gain on borrowing (the 'gearing adjustment') and the loss on holding monetary assets (the 'monetary working capital adjustment'). The SSAP 16 disclosures were required only to be supplementary, although they were permitted as the main financial statements.

The CCA experiment failed in the U.K., as elsewhere, for a variety of reasons, but the decline in the rate of inflation was undoubtedly an important factor. The lack of economic incentives was another factor: notably, the U.K. government decided (in 1982, and contrary to earlier indications) that CCA was too unreliable to be used as a basis for corporation tax. Also, the new government, elected in 1979, abolished the Price Commission and abandoned the policy of restraining inflation by means of price controls: this removed the possible attraction to business firms of using CCA (with its higher depreciation and cost of sales charges) as a means of justifying prices. There were also problems specific to SSAP 16: many preparers of accounts found it difficult to apply in practice and (particularly in the case of the gearing and monetary working capital adjustments) it was also found difficult to understand. Thus, compliance declined and the ASC withdrew the standard.

¹ Pong and Whittington (1996) trace the course of this decline and discuss its causes.

The Situation After SSAP 16: Mixed Valuations

Even before SSAP 16 was introduced, U.K. accounts were not prepared on a pure historical cost basis. Current valuations were permitted, and in some cases required to be disclosed, by company law. Since the withdrawal of SSAP 16, there has been a continuing trend towards the greater use of current values in U.K. financial reporting, for example, in the practice of marking-to-market commodity stocks. The Accounting Standards Board (ASB, which replaced the ASC in 1990) is attempting to regulate and systemize this process, as described in its discussion paper, *The Role of Valuation in Financial Reporting* (1993a), but the Board anticipates that a mixed historical cost/current value system will prevail for the foreseeable future. Insofar as current values are reported, the Board's preference as expressed in the measurement chapter of its *Statement of Principles* (1993b), is for current values to be based on a value to the business basis, that is, deprival values. A recent manifestation of this intention is the ASB's standard FRS 7, *Fair Values in Acquisition Accounting* (1994), which defines fair value on a value to the business basis. A similar conceptual basis (embodying the idea of the recoverable amount, which is one component of deprival value) is being used in the Board's current work on impairment (which applies both to tangible assets and goodwill), and the impairment test makes explicit the use of discounting in assessing value in use. However, impairment tests can be applied to assets measured on a historical cost basis, as well as those measured already at a current value, so that the use of impairment tests does not necessarily imply the full application of deprival value.

The Use of CCA by Regulated Businesses

Against this background of the use of mixed historical and current valuation in the accounts of most U.K. companies, one group of companies has shown a degree of enthusiasm for full CCA accounting. These are the recently privatized utility companies in the gas, electricity and water industries. The attraction to them of CCA appears primarily to have been its potential as a basis for regulation of the price cap. Most of them produce CCA only as supplementary data or for regulatory purposes, with main accounts on a historical cost basis, although one of the largest privatized utilities, British Gas plc, has consistently produced its main accounts on a CCA basis.

Prior to privatization, many of the publicly owned utilities reported on a replacement cost or deprival value basis and this practice was endorsed by the Byatt Report (1986), a report of a U.K. Treasury committee, which argued that a form of real terms accounting (with deprival value as the valuation basis and profit measured after general index adjustment of opening capital) was appropriate for monitoring their economic performance. The subsequent academic work of Edwards *et al.* (1987) endorsed this approach to assessing the performance of entities in both the public and private sectors, particularly in relation to identifying monopoly profits.

On privatization, as indicated above, for financial reporting purposes most of the utility companies resorted to the common U.K. practice of historical cost accounting, with occasional revaluation, in their main accounts. This was felt to make their

accounts more comparable with those of other listed companies; and the fact that CCA tended to give a lower profit figure gave a strong incentive to achieve such comparability in the eyes of investors. For regulatory purposes, on the other hand, the privatized utilities preferred to retain CCA, and the fact that CCA reported a lower profit and a larger asset base was possibly an advantage in the process of persuading the regulator to allow higher prices.

Unfortunately, CCA, as applied by these companies, did not provide a suitable basis for regulation, and this fact has been recognized by the regulators and by the Monopolies and Mergers Commission (e.g., in its 1997 Report on BG plc), which acts as an appeal body in regulatory cases. The reason for this is that the companies applied the deprival value rules on an *individual asset* basis which, when aggregated, gives an approximation to the replacement cost of the assets of the business. However, the flotation price of the businesses often included a substantial discount on the replacement cost of the assets of the business (the discount was about 60 per cent in gas and in some water companies was as much as 90 per cent). The regulator in such cases will allow only a reasonable return on the capital subscribed by the shareholder at flotation. Thus, the *aggregate* present value of the business is below the replacement cost of the assets: this is reflected in the so-called market-to-asset ratio being less than one. In such a case the *aggregate* current cost, or deprival value, of the business is much lower than the CCA value reported in the accounts (Carey *et al.*, 1994). This has recently been recognized by the auditors of BG, who have stated that the CCA values reported in the accounts should be written down to reflect the lower regulatory value.

However, the resulting measure of aggregate value, based on aggregate present value, is no longer a suitable basis for regulation. This value is determined by the regulator's decision to determine future cash flows and cannot therefore be a basis for that decision: if it were the process would be entirely circular. Thus, unfortunately, the one sector that has embraced CCA or deprival value has chosen an inappropriate application for it.

REFERENCES

- Accounting Standards Board, *The Role of Valuation in Financial Reporting*, Discussion Paper, ASB, 1993a.
- , *Statement of Principles, Chapter 5, Measurement in Financial Statements*, Discussion Draft (revised and issued as an Exposure Draft, 1995), ASB, 1993b.
- , FRS 7, *Fair Values in Acquisition Accounting*, ASB, 1994.
- Accounting Standards Committee, SSAP 16: *Current Cost Accounting*, ASC, 1980.
- Byatt, I. C. R. (Chairman), *Accounting for Economic Costs and Prices: A Report to H.M. Treasury by an Advisory Group*, 2 vols, HMSO, 1986.
- Carey, A., M. Cave, R. Duncan, G. Houston and K. Langford, *Accounting for Regulation in U.K. Utilities*, ICAEW, 1994.
- Edwards, J., J. Kay and C. Mayer, *The Economic Analysis of Accounting Profitability*, Clarendon Press, 1987.
- Monopolies and Mergers Commission, *BG plc*, report under the Gas Act 1986, HMSO, 1997.
- Pong, C., and G. Whittington, 'The Withdrawal of Current Cost Accounting in the United Kingdom: A Study of the Accounting Standards Committee', *Abacus*, March 1996.

DIETER SCHNEIDER

German Reflections on Asset Valuation

German financial accounting law is characterized by a close relationship between financial reporting and profit determination for tax purposes. This is due to the legally stipulated authoritativeness principle. That principle is the determining influence of financial accounting standards which affect standards for income taxation. But in fact a determining influence is actually exercised by regulations for tax purposes on profit determination in financial reporting.

Let me demonstrate this with three examples:

1. The different options of price level accounting allowed by the EC Fourth Directive have not been transformed into German law.
2. Many rules for profit determination in financial reporting have been adopted verbatim from already existing German income tax regulations (*Einkommensteuerrichtlinien*).
3. The obligatory write-backs as determined in article 35 paragraph 1(c) of the Fourth Directive practically have no effect on German balance sheets. German law stipulates that on the one hand valuation options based on tax law may only be exercised in accordance with their treatment in financial statements (section 5 subsection 1 sentence 2 EStG, the German income tax code), and on the other hand there exists an option based on tax law that if once a deduction for losses had occurred it may be retained (section 6 subsection 1 nos 1, 2 EStG). An example illustrates this. Ten years ago a German company bought a share at 200. Three years later the market price fell for more than one year and the share was valued at the lower market value of 100, its so-called *Teilwert*. Let us assume today's market price of the share is 600. For tax purposes this asset may still be valued at 100 but only if its value is also kept at 100 in the company's financial statements.

The draft of the 1998 German tax reform bill provides that the option to stick to a former lower *Teilwert* if the *Teilwert* has increased, is to be abolished. However, lobbyists cry out in horror about this proposal and there are further reasons why the bill will probably not be enacted in its current form.

The reason I stress the term *Teilwert* is that for ninety years it has in fact been a legally binding anticipation of the deprival value concept.

Compare for example Alexander's and Britton's (1996, p. 85) well-known definition of the deprival value: 'The deprival value (DV) approach says that the DV of



an asset is the loss that the rational businessman or businesswoman would suffer if he or she were deprived of the asset'. Or take a look at the concept of current cost versus the recoverable amount as the higher of either net-realizable value or economic value.

In both cases you will notice a striking resemblance to a ruling of the Prussian higher administrative court in a tax case of 5 March 1907 and its 1913 explication by Ludwig Mirre, who was president of the highest German tax court from 1935 to 1945: for the evaluation of fixed assets one had to choose the value that the item in question had to the business. For balance sheet items it had to be ascertained if they were so necessary to the business that they had to be recovered in case of their loss. If so, the replacement costs of these items would be their appropriate value. If a replacement was unnecessary, the value had to be assessed taking into account the usefulness of the item, but at least its net-realizable value must be considered.¹

The *Teilwert* used to be applicable for purposes of the former property taxation (repealed in 1997) and death duties. For the taxation of profit and in financial reporting, the *Teilwert* is only used if it was lower than the historical cost, reduced by accumulated depreciation. The usage of the *Teilwert* concept is generally based on the contrast between current cost versus net realizable value or economic value. The latter is usually employed with regard to copyrights, unregistered patents or an acquired goodwill.²

For the last seven decades, many German writers in financial and tax accounting fought against the *Teilwert* idea. However, their efforts were in vain as they were not able to gain ground against the judiciary's deeply rooted prejudice.

Analysing profit determination beyond the law, the *Teilwert* as the German deprival value is not needed to measure a basis for compulsory payments of profit taxes as long as a tax loss offset existed. The loss offset could even take the form of a carry-back or an interest-bearing carry-forward.³ For measuring contractual payments such as employee participation benefits or dividends, assets should be valued at historical cost and the difference between deprival value and historical cost may be allocated to a non-distributable reserve. In my opinion this would be sufficient for financial reporting. Current cost may be reported additionally.

As the original invitation to this symposium stressed the topic 'history of price and price level accounting with regard to deprival value', I first want to make reference to inflation accounting by maintenance of real capital, as proposed by Walter Mahlberg and Eugen Schmalenbach in 1920/21. Some of their problems had been discussed even earlier, for example, in a discussion between Carl Menger, the marginal utility theorist, and Taussig, a banker, at an official Austrian inquiry into monetary matters on 3 March 1892.

¹ Ruling of the 2nd Senate, dated 5 March 1907, *Entscheidungen des Königlich Preußischen Oberverswaltungsgerichts*, Vol. 50, 1908, p. 114; Mirre (1913, pp. 169f.).

² Schneider (1997, pp. 191f.).

³ Schneider (1997, pp. 283f.).

Current cost accounting for all balance sheet items can look back on a long line of predecessors. Fritz Schmidt and his *Organische Tageswertbilanz* (1921) is commonly known. Others like the Finnish scientist Ilmari Kovero (1912) and the Austrian Pawel Ciompa (1910) are less well known. However, the origins of current cost accounting may be found in France and Italy. May I only mention Eugène Léautey (1897), who a century ago came up with a proposal to record both historical cost as well as current cost, and the Italian Fabio Besta (1891), who based his work on Ricardo's theory of value.

After 1970, some of the large German companies released additional information based on current cost accounting in their financial statements. Their method bears a strong resemblance to proposals of the British Accounting Standards Committee made in 1981, 1986 and 1991.⁴ The companies used current costs only to value those assets that were financed by capital or reserves (*Nettosubstanzerhaltung*). The German discussion on *Nettosubstanzerhaltung* started after the Second World War as a critique of Fritz Schmidt.⁵ Again, tax law had anticipated the idea. During the hyperinflation of 1923 it was permitted to determine the value of inventories as a compound of two-thirds of their value at the beginning of the year plus one-third of their value at year end less 60 per cent (section 33a subsection 3 EStG 1923). According to an announcement of the Reich's Ministry of Finance, this valuation was limited to inventories financed by equity. Later in 1924 the supreme tax court (*Reichsfinanzhof*) confirmed this view.⁶ However, lack of time in this symposium does not permit a discussion of how debatable it is to link portions of the capital to individual assets.

In my view, the purpose of *Nettosubstanzerhaltung* in financial reporting is to try to restrict the amount of dividend payments. *Nettosubstanzerhaltung* is used as an argument to justify the redistribution of disposition rights from the investing principals to the managing agents.⁷

In the wake of the transformation of the EC Fourth Directive and due to the small inflation rates of recent years, additional disclosures of information based on current cost accounting have lost significance in corporate financial reports.

Let me conclude by stating objections to the optimized deprival value for price setting and the assessment of managerial performance as suggested for public utilities by the New Zealand Ministry of Commerce (1994) and by the Australian Society of Certified Practising Accountants (1996). My objections stem from the

⁴ Gerhart (1985, pp. 41–73); Wiedemann and Euler (1991, pp. 317–19); and Alexander and Britton (1996, pp. 117f.).

⁵ Especially Fischer (1947, p. 290).

⁶ Erler and Koppe (1923), pp. 107f., 123–8, 131–3; ruling of the Reichsfinanzhof I A 60/24, 17 October 1924, *Sammlung der Entscheidungen und Gutachten des Reichsfinanzhofs*, Vol. 14, 1924, pp. 342–8; also the 6th Senate in the ruling VI e A 125/24, 26 November 1924, *Sammlung der Entscheidungen und Gutachten des Reichsfinanzhofs*, Vol. 15, 1925, pp. 83–8.

⁷ For further details, see Schneider (1997, pp. 343–6).

way these institutions establish the economic value using a risk-adjusted discount rate that is based on the CAPM.

Since this is not the place to discuss the dubious character of CAPM-style discount rates and risk premiums, may I only briefly mention the fact that price changes must be taken into account not only in forecasting future payments but also when computing the risk-free discount rate.

If price changes were taken into account, CAPM-based discount rates and risk premiums must change if the market rate did not equal the real rate of interest plus the inflation rate plus the real rate multiplied by the inflation rate. This condition, known as the Fisher effect, disregards profit taxation. As a small contribution to the history of price level accounting, may I just remark that the Fisher effect was not invented by Irving Fisher (1896) but can already be found in Karl Knies' (1879) book on money and credit and even earlier in Henry Thornton's (1803) book on paper credit in Great Britain.⁸

The expositions of the New Zealand Ministry of Commerce and the Australian Society of Certified Practising Accountants suggest the conclusion that the market rate of interest is not increased by the inflation rate. This would lead to debtors' gains and creditors' losses. Uncertain asset yields and certain expectations about the rate of inflation would lead to changes in risk premiums and the CAPM-determined interest rate. The effect is similar to that of an unshiftable property tax: that is, depending on the type of risk aversion, the demand for risky investments may increase or decrease relative to the demand for risk-free investments and thus change the market portfolio.⁹ This is definitely true for a merely partial shifting of the inflation rate into the market rate and the asset yield. The risk premiums will clearly change if inflationary expectations are uncertain and only represented by a probability distribution. Therefore, in respect of economic value the so-called optimized deprival value completely loses its claim on optimality.

REFERENCES

- Alexander, D., and A. Britton, *Financial Reporting*, 4th edn, London, 1996.
 Besta, F., *La Raggioneria*, Vol. 1, 1st edn, 1891.
 Ciompa, P., *Grundriss einer Ökonomie auf die Nationalökonomie aufbauende natürliche Theorie der Buchhaltung*, Lemberg, 1910.
 Erler/Koppe, *Geldentwertungsgesetz*, Berlin, 1923.
 Fama, E. F., and G. W. Schwert, 'Asset Returns and Inflation', *The Journal of Financial Economics*, Vol. 5, 1977.
 Fischer, F., *Die Kritik der organischen Tageswertrechnung*, Doctoral dissertation, Frankfurt am Main, 1947.
 Fisher, I., 'Appreciation and Interest', *Publications of the American Economic Association*, August 1895.

⁸ See Thornton (1803/66), pp. 137–40; Knies (1879), pp. 105–9, 211; Fisher (1895), pp. 9, 13f, 30, 43, 66, 88fn 2.

⁹ See Truxius (1980, pp. 316–25; 1981, pp. 918f.); Lintner (1975, pp. 259–80); and Fama and Schwert (1977, pp. 137–9).

GERMAN REFLECTIONS ON ASSET VALUATION

- Gerhart, S., *Theorie und Praxis inflationsbereinigter Jahresabschlüsse im angelsächsischen Bereich*, Frankfurt am Main, 1985.
- Knies, C., *Geld und Kredit: Zweite Abtheilung: Der Credit, Zweite, Hälfte*, 1879.
- Kovero, I., *Die Bewertung der Vermögensgegenstände in den Bilanzen privater Unternehmungen mit besonderer Berücksichtigung der nicht-realisierten Gewinne und Verluste*, Berlin, 1911.
- Léautey, E., *Traité des inventaires et des bilans*, Paris, 1897.
- Lintner, J., 'Inflation and Security Returns', *The Journal of Finance*, Vol. 30, 1975.
- Mirre, L., 'Gemeiner Wert und Ertragswert', *Zeitschrift des Deutschen Notarvereins*, Vol. 13, 1913.
- Schmidt, F., *Die organische Bilanz im Rahmen der Wirtschaft*, 1st edn, Leipzig, 1921.
- Schneider, D., *Betriebswirtschaftslehre*, Band 2: *Rechnungswesen*, 2nd edn, Munich and Vienna, 1997.
- Thornton, H., *An Enquiry into the Nature and Effects of a Paper Credit of Great Britain*, 1803. Reprinted in J. R. McCulloch, ed., *A Select Collection of Scarce and Valuable Tracts and Other Publications*, London, 1962/66.
- Truxius, D., *Portefeuilleplanung und Risikoverhalten*, Frankfurt am Main, 1980.
- , 'Portefeuilleplanung in der Inflation', *Zeitschrift für betriebswirtschaftliche Forschung*, Vol. 33, 1981.
- Wiedemann, H., and G. Euler, 'Internationale Entwicklungen im Inflation Accounting: Eine vergleichende Darstellung', *Betriebswirtschaftliche Forschung und Praxis*, Vol. 43, 1991.

R. J. CHAMBERS

Wanted: Foundations of Accounting Measurement

Key words: Accounting; Foundations; Measurement

INTRODUCTION: 1997

From time to time for over 150 years pervasive flaws in accounting thought and practice have been brought to notice. The principal focus of attention has been the almost limitless array of valuation (or quantification) rules that have emerged under the widely fostered view that each mercantile firm may choose (and vary, as it pleases) the combination of rules that its accounts will follow. For the past seventy years professional and regulatory bodies have affirmed the desirability of 'reducing the variety' of those rules. But time after time the task has been shirked—to the point where one of the latest major exercises simply averred that five different valuation bases (called 'attributes') are used in present practice, and their use was expected to continue (FASB, 1994/5, p. 151).

But to return to the immediate antecedents of 'Wanted: Foundations of Accounting Measurement'. In 1966 was published *A Statement of Basic Accounting Theory* (ASOBAT), prepared by the Committee on Foundations of Accounting Measurement of the American Accounting Association (AAA, 1966). This, surely, was a proper place to deal with the logical conditions of aggregation and relation—and measurement generally. But, like most other products of committees and boards in the U.S. and elsewhere, ASOBAT had little to say about accounting as measurement. Perhaps the 'Foundations' committee was set up to make good that oversight; for, if accounting could be shown, by argument and illustration, to be an exercise in measurement, nonsensical, superfluous, mutually contradictory rules could be eliminated.

The Report of the Committee (AAA, 1971), however, promised none of these things. The critique here reproduced verbatim was submitted to *The Accounting Review* in August 1972. Publication was declined. One copy of the manuscript was returned to the author with copious notations by way of objections by the referee, who, by use of the authorial 'we', appeared to have been a member of the Committee. Among the notations were the following:

ungentlemanly, inferential and flagrantly misleading . . . ridiculous and mischievous [*sic*] prattle . . . The writer is either a quixotic dreamer or a heavy handed collectivist . . . Raving

of a literate and ignorant word-jockey . . . the writer has distorted wholly out of context the spirit and conclusions of the report to suit his own purpose of mounting a glib, attention-getting attack on a major committee report . . . I'm tempted to recommend publication of this student's paper despite its many misrepresentations, flaws of exposition, emotional hostility to the Committee, and minor goofs. Someone should come along behind it, though, to clean up the mud it will sling around.

Whatever flaws the critique may have had could not match this for venom. But, that apart, rejection of the critique forestalled open debate; reinforced the use of guesswork magnitudes (e.g., discounted net cash flows) in accounts of the past; fostered the erroneous addition of past, present and future magnitudes; set a pattern of disregard for the far more disciplined examination of measurement to be found in other fields; and did nothing by way of reducing the diversity of valuation rules tolerated in present thought and practice.

Now, over twenty-five years on from the Report, similar exercises have been initiated in the United States, Canada, Britain and Australia, all on the same pattern and all exhibiting the same disregard for the mathematical and practical constraints respected in every other field of disciplined endeavour.

The rules of the game have been laid out at length in my 'Metrical and Empirical Laws in Accounting' (1991). But will they be noticed in any resulting professional discourse on measurement in Australia or elsewhere? Or will it still be possible to say: 'Wanted: Foundations of Accounting Measurement'?

CRITIQUE: 1972

It might have been hoped that the Committee on Foundations of Accounting Measurement of the American Accounting Association (AAA, 1971) would have produced some conclusions in the nature of foundations; something of an elementary kind which might provide the groundwork for more elaborate or more sophisticated exercises. Its report is disappointing. It ranges over an almost limitless territory. But it finishes almost exactly where it started: 'New guidelines are desperately needed . . . The lack of new guidelines for accounting is the most serious problem to be faced' (p. 48). But worse than the failure of the Report to give direction is its potential for misdirection.

The Report begins with an 'adopted' definition: 'accounting measurement is an assignment of numerals to an entity's past, present and future economic phenomena, on the basis of observation and according to rules' (p. 3). This, as we shall show, is complicated and vague enough. But it is made even more vague by the following sentence: 'Under this definition, it should be pointed out, the rules employed need not be good ones and observations made need not be correct to qualify as accounting measurement'. Freed from the need to employ 'good' rules for assigning numerals and from the need to make 'correct' observations, apparently any numbers that masquerade as (look like) measured magnitudes will qualify as accounting measurement. That, of course, is the standard recipe for the success of fraudulent misrepresentation, as any reader of the history of commercial fraud will know.

But return to the definition. It allows that accounting measurement includes the assignment of numerals to an entity's past, present and future labour turnover, market share, unfilled orders, total labour force and many similar things; for, as well as I can judge, these are all economic phenomena of an entity. Yet none of them falls within the only two types of accounting system, 'equity accounting' and 'operational accounting' (as they are commonly understood), contemplated by the Committee. The definition allows also that accounting measurement includes the assignment of any kinds of numerals. But the knotty problems which confront accountants concern themselves with the assignment of numbers of dollars, not numerals at all. As I understand it, the object of a definition is to limit the scope of usage of a term so that one can come to close grips with it and make good use of it, as of a fine tool, for the purpose in hand. But the Committee's definition is so open, it provides so many things to talk about, that we should not be surprised if it comes to close grips with none of them.

Properties, Scales and Units

It would have been instructive if the Committee had begun with a discussion of measurement *simpliciter*. It is true that most of the discussions of measurement occur in the context of particular branches of science. But they have sufficient elements in common to justify some general specifications of the object and process of measuring.

In the first place, every particular measurement scheme requires the specification of the property of a class of objects which it is of use and interest to measure. The Committee, almost as an aside, alludes to what might have provided such a specification: 'accounting is indispensable in measuring and reporting organizational wealth and its changes' (p. 7). But the point is not developed. What wealth is, how it is measured and how changes in it are measured are not discussed.

In the second place, every measurement scheme requires the specification of a scale of some kind which makes it possible to distinguish the extent to which every object in the class possesses the specified property. At least some important contributions to the literature of measurement distinguish ordinal scales, interval scales and ratio scales. These scales (or rather measurements taken in them) have different mathematical characteristics. As the addition of measures is so common in accounting processes, it is necessary to consider the conditions under which addition (and other forms of relation) are mathematically permissible—and in fact to stipulate the kind of scale which is appropriate to accounting. Nowhere in the whole Report is there any discussion of scales of measurement.

In the third place, every measurement scheme requires the specification of a unit in the scale, and the conditions under which unit measurements shall be deemed to be of equal significance. In brief, this requires specification of the meaning of the 'standard' unit. This is necessary since measurements may be taken in a variety of non-standard situations, such that the raw or crude measurements are not comparable or addable. Nowhere in the Committee report is there any discussion of the unit of measurement, either in general terms or in the terms appropriate to accounting measurement.

Kinds of Measures

One of the great advantages of measurement schemes is that they make possible the development and use of notions other than the simple ostensible properties of particular objects or collections of objects. Sums, averages, proportions and such notions as area, density and velocity are examples. The Committee Report touches the fringe of this 'extended' field of measurement. It distinguishes between primary measures (direct measures of properties directly measurable) and secondary measures (derived by 'algebraic transformation of a set of numbers which are direct measures of some objects or their attributes', p. 20). But the discussion is both inconsistent and incomplete.

Consider first a significant inconsistency. Among the examples of primary measures are *counts* of physical quantities, and *prices* of non-monetary goods. In respect of prices, it is said that they may be past, present or future prices (p. 20). No such stipulation is made in respect of physical counts. Either, therefore, counts and prices are not members of the same class of measures (i.e., primary measures), or both should be treated in the same way (i.e., it should be allowed that physical counts may be past, present or future counts). Did the Committee shy away from speaking of a 'future count' as a measure at any present time? If it did, it followed the course of common usage and commonsense. It is just not possible to count any future physical quantity, in the sense in which 'count' is customarily used. Recall that the definition of accounting measurement referred to 'the assignment of numerals . . . on the basis of observation and according to rules'. There can be no observation of a future quantity of things. And for exactly the same reason there can be no observation of a future price.

In defence of the Committee it might be said that the phrase 'according to rules' may be construed so as to include the derivation of future prices on the basis of observed past and present prices. But, on the one hand, there are no rules by which a certain future price may be derived from observed past and present prices. And, on the other hand, if there were any such rules they could as easily (or more easily) be applied to future physical quantities. Hence the inconsistency in the exposition of the Committee would remain. But in any case, the Committee gives no treatment to the meaning to be ascribed to the phrase 'according to rules'; nor is any independent writer on measurement cited as authority or support for the idea that 'rules' includes rules for prognosticating any future quantities. Indeed, if future quantities and prices were as firm and reliable as past or present (measured) quantities and prices, the whole problem of uncertainty would have been swept away!

The inconsistent, lopsided or asymmetrical treatment (with respect to time) of physical quantities and prices appears to be an attempt to force unlike operations and results into one class of things on the ground that the elements of that class have 'numerals' in common. It is not unlike the fallacy of concluding that $2 = 4$ on the ground that $2 \times 0 = 4 \times 0$. But the incompleteness of the discussion of primary and secondary measures is even more serious.

Secondary measures are distinguished from primary measures on the ground that the former are derived by algebraic transformations of direct (primary) measures. Now, in the first place, algebraic transformations are only permissible (or

mathematically legitimate) under certain conditions. Measurements taken on scales calibrated in different units may not be added without first converting them to measurements in a common scale. Pounds sterling may not be directly added to pounds Israeli; nor dollars U.S. to dollars Hong Kong. Measurements of different properties of a set of objects may not be added. A measure of height may not be added to a measure of weight, obviously. But neither may the selling prices of some objects be added to the purchase prices of other objects, if it is expected to obtain some aggregate pertinent to any financial calculation or negotiation. It is not necessary to go more fully into the mathematical conditions under which aggregation and relation are permissible. These two examples will suffice to indicate the incompleteness of the exposition. For, at one point we are told that a 'summation of numbers in different units' is a (secondary) measure (p. 21); though what such a summation can be 'a measure of' is inconceivable. And at no point is any question raised about the legitimacy of many traditional accounting operations, such as adding market prices and cost prices in balance sheets. And nowhere at all is there any hint of a discussion of the universally known fact that monetary units, in which all things presently considered as accounting measurements are expressed, do not have the same significance from year to year. A report on the foundations of accounting measurement can scarcely be expected to get far when it disregards the most elementary rules governing addition and relation.

In the second place, the Report makes no mention of an important class of measures which the Committee might describe as secondary measures, but which others have described as derived measures. Examples are the current ratio, the debt to equity ratio and the rate of return. These are widely accepted as measures of liquidity, leverage and efficiency, respectively. Perhaps the Committee did not consider these to be secondary measurements. But it did aver that 'the significance of numerals reported in accounting is solely their significance in reaching economic decisions' (p. 23). There can surely be no doubt that the above-mentioned ratios are used in making economic decisions. It is therefore quite pertinent to inquire into the conditions under which, say, a measure of current assets may be related to a measure of current liabilities if an indication of solvency is sought. As current liabilities are amounts to be paid, the measure of current assets should surely represent what is available, in money or approximate money's worth, to pay off those liabilities. Now, observe this: no valuation of inventory at cost, or at the lower of cost and market, or at LIFO, can give any indication of the money or money's worth available to pay off any debt; and no valuation of marketable securities at cost can give any such indication in respect of those securities. Here is a quandary. To make decisions (at least some decisions) a measure of solvency is sought; but the numbers commonly reported do not enable a properly informative measure of solvency to be derived. Is something wrong with the numbers, then? Yes, indeed. They are not numbers which have 'significance in reaching economic decisions'. In fact, a number (of dollars) representing 'lower of cost and market' or 'LIFO' is *not a measure* of any describable property of an inventory.

This kind of analysis could be extended to the other ratios mentioned, or to other aggregates and differences such as net income—with exactly the same conclusion.

But the Committee makes no such analysis and reaches no such conclusion. Why? For no apparent reason, other than perhaps a determination to consider as a measure or a measurement any number which does or could now turn up in an accounting statement or calculation. It might have been expected that a discussion of such an exacting exercise as measurement would itself be exacting, would discriminate between what are measures and what are half-breed or mongrel numbers *posing* as measures. But the Report gives no satisfaction in this respect.

Measuring and Quantifying

The Committee plays fast and loose with the term 'measure' when it comes to deal with 'retrospective, contemporary and prospective measures'. It is conceivable that one may seek to *quantify* a particular property of some former but now non-existent object, and to *quantify* a particular property of some (expected) future but not yet existent object. The question is, whether such quantifications can properly be described as measurements. This may seem to be an arid question, a matter of splitting hairs. But its importance lies in the freedom or constraint with which numbers purporting to be measures may be added and otherwise related.

The operation of measuring, in the simplest of cases, entails the establishment, by observation, of correspondence between the magnitude of a property of an object and a particular point on a calibrated scale which is designed to represent various magnitudes of that property. Length and weight (or mass) are so measured. Typically the measurer does not invent the scale or the instrument of which the scale is a part. He makes use of the conventionally accepted scale and the appropriate instrument or process by which correspondences between the observable and the scale are established. He must, of course, use the measuring instrument in the way in which it is used by 'competent' measurers, that is to say, by persons familiar with the instrument and familiar with the manner in which measurements so made can profitably be used.

Even in these very simple cases of measuring it is possible that 'readings' may be taken which are not measurements, but mistakes. If the zero point on a measuring rod is not at the very end of the rod, to apply the end of the rod to one end of an object whose length is to be measured will result in a mistake, not a measurement. If a physical balance is not properly adjusted before setting about to find the mass of an object (or if the butcher puts his thumb on the object pan) the result will be a mistake (or a fraud), not a measurement. If one learns that the volume of an object may be found by immersing it in a calibrated tank containing a liquid, and then goes through all the necessary steps except seeing that the object is fully submerged, the result will be a mistake, not a measurement. These may seem trivial examples. But each of them illustrates the necessity of following strictly the rules for measuring properties by specified instruments. Each of the improper operations described enables the observer to assign numbers, or numerals—but it would be fatuous to describe these numbers as measures or measurements.

For exactly the same reason, it would be fatuous to describe as a measurement of the aggregate length of a set of objects the sum of the separate lengths of the objects, if some of those lengths were measured according to the proper rules for

measuring length and some were not. Now, apply the same test to one aspect of accounting. The Committee notes that 'accounting repeatedly has been regarded as the theory and practice of measurement of income and wealth' (p. 47); and apparently it endorses this view. It does not say how wealth is measured, so we must construct some notion of this. If a man has \$10,000 in cash only and has no debts outstanding, we would say his wealth is \$10,000. But if he has \$5,000 in cash, some bonds for which he paid \$5,000 but which now stand at a 40 per cent discount in the market, and if he has no debts outstanding, we would not say his wealth is \$10,000. We would say it is \$8,000; for wealth, in terms of money means how much a man can now spend if he wishes. It would be foolish to say his wealth is \$10,000 in the latter case, because that figure is the sum of two figures representing quite different 'properties' of the cash and the bonds. Long ago Canning (1929, p. 319) pointed out that 'the balance sheet valuations of accountants are of mongrel origin' and that diverse valuations of diverse things are added to find an asset total that, dollar for dollar, cannot have a common significance. In effect, Canning asserted that scarcely any two amounts representing asset classes in a balance sheet can be added, legitimately, to obtain a measure of the wealth of an entity in respect of those classes; and *a fortiori* a balance sheet total for assets cannot be taken as a measure of aggregate wealth. And he backed up his case with a clear identification of the diverse valuations of which he spoke. Curiously, one may read the whole of the Committee's report without getting a hint of the problem to which Canning and Sweeney and others have so sharply drawn attention. Curiously, we say, because the problem is an elementary or fundamental measurement problem.

It follows that, although accounting may be regarded as 'the theory and practice of measurement of income and wealth', accounting as it is done is not in fact an exercise in the measurement of wealth and income at all. For just as mistakes may be made in the simplest acts of measuring, mistakes may be made in the measurement of income and wealth. It is a mistake to consider the cost of an asset as a representation of or measure of the wealth (or part of the wealth) of its owner. And if mistaken representations of wealth are made at successive dates, the increment in wealth (income) during the interval will not be properly represented. The Committee apparently does not see these things as mistakes. Yet they are just the kind of mistakes which have led to the bankruptcy of many and to the costly litigation and settlements which have fallen on many professional accountants in the recent past.

Now, to quantify the elements of a future state is an exercise far more complex than the measuring of a property of a single object or the measuring of the property aggregate of a collection of objects. First, at least some of the elements of a future state are not yet existent. No number can be assigned to any property of those elements on the basis of observation. And, second, the elements of a present state which are expected to be elements of the future state will undergo changes in the interval. No number can be assigned to the magnitude of these changes on the basis of observation.

The Committee may protest that these objections overlook the phrase 'according to rules' in the definition of measurement. We have already hinted that the

reference to 'rules' relates to the rules for measuring observable objects. But the Committee would have us believe that 'there exists an extensive and well-founded body of theory concerning how to make prospective measurements' (p. 29). This is hard to believe. For, if the body of theory (whatever it is) is well-founded, one would suppose that those who know it would be perennially successful; they would never err, since they would know the future as well as they know the present. Needless to say, the Committee gives no example of such omniscient paragons. Furthermore, if there were such a body of rules for making prospective measurements, it would be expected that all competent 'measurers' would reach the same conclusion approximately about the size of some prospective magnitude; for they would only have to apply the rules to the already given past and present measures to obtain the result. But it is notorious that those who attempt to quantify future magnitudes may obtain vastly different results, as well as results which differ materially from what the magnitude turns out in due course to be.

The Committee, however, seems to have been so anxious to thrust 'future measurement' upon us that either it devised some mistaken argument to support its case or failed to see that its arguments contain *non sequiturs*. Thus: 'by the time the estimator has reacted to a present thermometer reading, that reading already is slightly in the past; yet one uses it to estimate present temperature. Therefore even when one measures present temperature, there is a slight element of futurity in the measure' (p. 29). Note the 'therefore', signifying a conclusion or inference from the previous sentence. But the previous sentence says nothing about the future. The conclusion or inference is a *non sequitur*. Some pages later the Committee felt it necessary to reinforce the point; for 'some may feel uneasy about speaking of forecasts as measurements' (p. 46). The Report cites five authorities (two of them members of the Committee), none of which, in the passages quoted, gives any ground for regarding future magnitudes as measurements. It then asserts that every measurement is 'a process of estimation', 'that the difference between measurement and estimation as used in common parlance is, from a scientific point of view, merely a matter of degree' and that "'estimation" usually refers to measurement with a comparatively high range of error'. The (subtle) transition from measurement to 'estimation with a high degree of error' opens the way to including magnitudes of anticipated events in 'estimates with a high range of error'—at least so it seems. For, hey presto!, 'accordingly' the Committee's definition of accounting measurement could include reference to future magnitudes (p. 47). But the whole of this rests on the treatment of an estimate of a present magnitude and an estimate of a future magnitude as if they were the same in kind. They are not. Epistemologically, that is, in terms of what we are entitled to assert that we *know*, the two types of estimation are very different in kind. Again, the Committee's conclusion rests on a *non sequitur*.

Equity Accounting and Operational Accounting

Early in the Report the Committee distinguishes between 'equity accounting' and 'operational accounting'. Even at the outset it is not clear in what the difference subsists. It is said that equity accounting is 'aimed at reconciling the equities of

shareholders and other interested parties' while operational accounting is 'aimed at providing useful information for management and investor decisions' (p. 3). Since the class of persons who are investors includes the class of persons who are shareholders, and since shareholders as investors make decisions with the object of protecting or advancing their interests or equities, there seems to be little substance in the distinction, as far as the principles of measurement are concerned. There may, of course, be differences in the amount of detail which will be serviceable to managers and shareholders. But this does not entail any difference in the rules of measurement appropriate to the two kinds of accounting—if there are two kinds.

The Committee thinks otherwise. 'Although the objects of measurement in operational accounting are in many cases the same as those in equity accounting, the orientation and the methodology of measurement are quite different' (p. 11). Just what does this mean? If a manufacturer of tables makes thirty inch by fifty inch tables, is the 'orientation and the methodology of measurement' different for him and for the buyer of tables? One would suppose that the measurements, as measurements, mean exactly the same to both parties and would be taken by exactly the same processes or methods by both parties.

The Report later reopens the discussion of the matter with the 'balls gambit' (p. 33). This is a very curious exercise, unlike anything which businessmen, investors and accountants do. Players A and B draw balls, in turn, from two urns; the drawer of the heavier ball in each round gets the greater part of the fixed payoff for each round. There is an Equity Accountant, who seems to be a referee or judge. He weighs the balls drawn by A and B, 'using a somewhat imperfect scale' for the purpose. 'Due to the inaccuracy of the scale, Equity Accountant is allowed to adjust his reading of the scale as he thinks it necessary'. His announced result determines the payoff to A and B. A engages Operational Accountant who, using another imperfect scale, weighs the balls A draws with the object of discovering whether or not the balls in one urn are, on average, heavier than the balls in the other urn; for it would be 'more profitable' to A to draw balls from the urn containing the heavier balls. But why would it be more profitable? Equity Accountant may, in fact, adjust his readings in any way at all 'if he thinks it necessary'. Because the two 'accountants' use different scales, both imperfect (and as far as we know imperfect in different ways or in different degrees), A has no way of telling whether Equity Accountant is biased, or whether his 'adjustments' are random, or how great or small the 'adjustments' are; for A has no access to B's balls. A would be foolish to base his decision on what his Operational Accountant could tell him.

Now, notwithstanding the facts that both accountants use imperfect scales and that Equity Accountant may adjust his readings if he thinks it necessary (no grounds specified), the Committee says that both accountants 'provide information on the weights of the balls'. Surely they do not. All the so-called information is misinformation; and the payoff is based on 'fiddled information'—'the number which Equity Accountant decided to choose' (p. 34). There may be such crazy games and crazy players. But where there is no standard measuring equipment, anything can happen. That's not a game, but a gamble. And the exercise throws no special light on problems of measuring.

But it is necessary to the conclusions which the Committee expects us to accept. For, first, we are told that a shareholder can 'enjoy the benefit of the company's financial accounting system [equity accounting]' even without reading a single word of its financial reports (p. 34). This alludes to the payoff in the form of dividends. But it completely disregards the financial reports as a source of information leading to investment in a given company and to disposal of an investment when other and better opportunities present themselves. The Committee's investor is completely passive—the stock exchange is out of business!

And second, we are told, in respect of equity accounting, that

a measurement process which is completely arbitrary and useless for any decision can be very useful if the parties agree to base the determination of their equities upon it . . . apples can be added to oranges, pound for pound, if all interested parties agree to distribute the payoff. Theoretically meaningless allocations of costs and revenues can also be done and in some cases must be done in order to distribute the payoff. (pp. 34–5)

There is confusion and misdirection in abundance here.

To suggest that a completely arbitrary process is a measurement process is offensive both to commonsense and to the Committee's own definition, which says 'according to rules'. We cannot have it both ways. Either measuring is non-arbitrary, and all arbitrary quantities are not measurements; or any old thing can be a measurement, and you, reader, could be fifty-seven feet tall. Next, to suppose that parties who divide the payoff would *agree* to accept a completely arbitrary method of determining the payoff is beyond reasonable belief. If they must put up with such a process and the result, they do so in ignorance of any way of improving their lot—not because they voluntarily and knowingly agree with the process. Next, to speak of the distribution of apples and oranges, 'pound for pound', misconstrues the problem to which the Committee alludes. A dividend when paid does not consist of a mixture of anything—every shareholder receives homogeneous dollars from any given distribution of dividends. What, in fact, is done in conventional accounting is calculate a net income in which, to use the Committee's analogy, a pound of apples is not the same pound weight as a pound of oranges. The problem of mixing different dollars is thus evaded by misstating what occurs. Next, there is no reason whatever for saying that 'meaningless allocations . . . must be done' in order to distribute the payoff. One of the reasons for looking at accounting as an exercise in measurement surely is to produce some refinement in its processes, to substitute something exact, or more exact, for arbitrary allocations which are not measurements. There can be no 'musts' about 'meaningless allocations'; what is meaningless should be weeded out of any set of practices which purports to represent what has occurred. Indeed, the Committee itself seems to acknowledge this in the next paragraph of its Report, where it says 'arbitrary allocations are to be discouraged for any economic decisions, including investment decisions by stockholders and potential stockholders' (p. 35). Now, as equity accounting yields the reports which are made available to stockholders, this remark is in direct contradiction of the spirit of the earlier remark that meaningless allocations are permissible, if not mandatory, in equity accounting.

There are indeed grounds for believing that the quality of the factual (measured) information which managers use must be the same as the quality of the factual information which investors and others use. A company is not completely independent of its stockholders and other financial supporters. It must maintain its solvency and a rate of return which, by comparison with other companies, justifies the continued belief of investors in its economic viability. If its principal financial features deteriorate, its management must take steps to restore them. By this we mean substantive steps; not the kind of steps which some seem to take—such as changing the accounting rules used (i.e., resorting to arbitrary devices and figures) to bolster the reported results and position. It should be clear that no conclusions can be drawn from ‘internal’ (operational?) information which will lead to an improvement in the externally reported (equity accounting) information unless the two classes of information are the same in kind, of the same quality, mutually consistent. The Committee apparently has never tried to convince a traffic officer that the speed limit was not being exceeded on the ground that the driver’s ‘operational information’ is all that should be used in deciding the matter. Let them not try: it won’t work.

In Sum

We have by no means exhausted the points at which issue may be taken with the Committee’s report. But sufficient of such points have been noticed to put in serious doubt its nature and the Committee’s intention. Let’s recapitulate.

- There is no clear stipulation of the financial ‘properties’ of objects and events which decision makers (managers or investors) can properly use to make judgments about particular companies or to make legitimate comparisons between companies.
- There is no discussion of the kind of scale in which the extent of the possession of any such property by any object may or should be assessed.
- There is no discussion of the unit in which measures of financial properties are or can be expressed; and there is no discussion of the mode of measuring when the unit used at any particular time is different in significance from the unit used at a different time.
- There is inadequate discussion of the variety of measures of financial characteristics used in practice—the subaggregates, aggregates, ratios, and percentages so commonly derived and so obviously relevant to decisions or choices. The inadequacy is crucial, since there are quite definite conditions under which aggregation and relation are legitimate and their results informative. The report is perhaps more in the nature of a polemic than a survey, or an exploration.
- The whole problem of the monetary unit is evaded. On the one hand, the definition and other parts of the discussion refer to ‘numerals’, when in fact numerals of themselves mean nothing. And, on the other hand, in the whole Report there are only one or two places where ‘dollar’ and dollar signs occur, and then never in proximity to ‘measure’ or ‘measurement’.

- By recourse to the notion that an arbitrary numeral can be a measure or measurement, it is implied that the quantities of dollars which are assigned to things in balance sheets are necessarily measures. Apparently we must not ask whether any quantitative statement is a measure (or a measurement); it is, *ipso facto*—or so the Committee would have us believe.
- The Report tries hard to make stick the idea that we can *measure* a future (non-existent) thing. A little juggling with 'estimate', in the sense of approximate quantification of an observable, turns it into estimate in the sense of prognostication. There is, of course, evidence aplenty of mistaken, loose and metaphorical uses of 'measure'. But, if we value logical rigour, as the Committee says we should (pp. 5, 37), we should take care to distinguish these usages, rather than lump them all together as if they were the same. A future quantity may be a useful figment of our disciplined imaginations. But it is not an observable—and hence, according to all writers who associate measurement with observation, it is not a measurable.
- The Committee works hard to justify the notion that equity accounting and operational accounting yield 'measures' which are different in quality and necessarily different. But the argument cannot be sustained; if even a few examples had been used involving money figures (instead of the balls gambit), it would have been apparent that the postulated differences would lead to gaps in the chain of inferences by which optimal courses of action are chosen.

With one observation of the Committee we can certainly agree: 'New guidelines are desperately needed . . .' (p. 48). Still.

REFERENCES

- American Accounting Association, *A Statement of Basic Accounting Theory*, AAA, 1966.
- , 'Report of the Committee on Foundations of Accounting Measurement', *The Accounting Review*, Supplement, 1971.
- Canning, J. B., *The Economics of Accountancy*, Ronald Press, 1929.
- Chambers, R. J., 'Metrical and Empirical Laws in Accounting', *Accounting Horizons*, December 1991.
- Financial Accounting Standards Board, Statement of Financial Accounting Concepts, *Accounting Standards*, FASB, 1994/5.

R. G. WALKER AND JANET MACK

The Influence of Regulation on the Publication of Consolidated Statements

The impact of regulation on the publication of consolidated statements by Australian listed companies is examined by reviewing evidence of the first use of consolidated statements by holding companies listed on the Sydney Stock Exchange, excluding companies incorporated elsewhere, and relating that evidence to the chronology of the development of statutory, professional and stock-exchange regulations permitting or prescribing the use of consolidated statements. The findings are that the wider adoption of consolidation accounting has been associated with changes in statutory and other forms of regulation. These findings contradict the conclusions of earlier studies (Whittred, 1986, 1987, 1988), namely that regulation was of minimal influence, and that the adoption of consolidation accounting was explainable by 'contracting cost variables'. Major flaws identified in these earlier studies were an apparent failure to recognize that Sydney listed companies may have been subject to regulations established in other jurisdictions, and a crucial misinterpretation of the history of Australian stock exchange listing rules, which led to the misidentification of listed companies as having adopted consolidation 'voluntarily'.

The findings also underline comments made previously in critiques of other papers which have tested hypotheses incorporating agency or contracting costs. While historical analysis can assist the exercise of judgment in the classification of events, those who rely on historical evidence in the development of theories and in framing hypotheses should use that evidence with care, having regard to pertinent contextual factors.

Key words: Consolidated financial statements; History; Regulation.

Many recent contributions seeking to explain why accounting practice is what it is have sought to explain the history of accounting or auditing practices in terms of a narrow set of hypotheses involving only economic variables. At the extreme, some researchers have titled their studies as examining the 'determinants' of accounting choices (see, e.g., Hagerman and Zmijewski, 1979; Lemke and Page, 1992; Aitken and Loftus, 1994; Whittred and Zimmer, 1994), as if to suggest that there was a simple causal relationship between these variables and reporting practices—so that economic relationships or contracts *determined* what accounting policies were adopted in particular settings.¹

¹ It must be acknowledged that researchers have often been careful to draw limited conclusions from their findings, and to speculate about the relative significance of variables, so that the commentary within those papers often belies their titles.

Moreover, some have relied on the findings from such narrowly focused studies to suggest that regulation has played a minimal role in influencing accounting practice—or that it was far less significant than ‘economic’ or other variables. In effect, it is claimed that regulation does little to shape accounting practice. Rather, accounting practice is seen as the precursor of regulation, in a process whereby certain accounting practices come to the attention of regulatory agencies, which determine a preference for specific practices and then reinforce or mandate those techniques.

There are certainly instances where some accounting techniques (e.g., the establishment of provisions for doubtful debts, or the recording of depreciation on durable assets) were widely used and widely accepted before the introduction of regulatory requirements requiring the adoption of those techniques. Equally, there have been cases where regulations have prescribed disclosures (such as cash flow reporting) not previously used in practice.

Yet this narrow, deterministic view of the history of accounting practice dismisses a range of other factors which may have influenced practice or regulation (or both). These include debates within the professional or research literature about the merits of different accounting methods, the transfer of ideas across country borders, or the influence of educational programs.

There have been very few empirical studies which have investigated *the impact of regulation* on accounting practice. Exceptions include Whittred’s (1986, 1987) studies of the adoption of consolidated financial reporting. Whittred sought to explain the popularization of the use of consolidated statements on Australia by invoking a hypothesis commonly associated with agency theory and the work of Watts and Zimmerman (1986): managers will adopt accounting procedures to reduce agency costs and maximize the value of the firm to the benefit of all participants. Whittred’s ‘central argument’ was that ‘in those instances in which (consolidated) financial reporting was adopted it reduced agency costs’ (Whittred 1987, p. 259).

An extension of such an argument is the claim that managers face sufficient incentives to provide ‘appropriate’ accounting information; and that hence there is no need for regulation. Whittred argued that regulation played a minimal role in the introduction of financial reporting via consolidated statements in Australia. He referred to instances of companies voluntarily using consolidated statements, and relied on these cases as evidence that the wider use of consolidated statements was closely associated with the emergence of a ‘market for debt’. While conceding that the development of consolidated accounting was unlikely to have been totally independent of regulatory activity, he claimed that the evolution of consolidated financial reporting ‘was a natural response to an increasingly sophisticated and innovative market for debt capital’ (Whittred, 1986, p. 116). Whittred’s 1986 and 1987 studies have been subsequently cited as demonstrating that ‘consolidation policy was driven by the underlying economics rather than by opportunism’ (AAA, 1996).

This study replicates Whittred’s studies of consolidation accounting in Australia, insofar as it examines the reporting practices of a set of listed companies over an extended period. Whereas Whittred’s studies sought to determine the incidence of voluntary adoption of consolidation accounting (i.e., adoption prior to regulatory requirements), this study assesses the significance of regulatory influences on the use

and popularization of consolidation accounting. As such, the main purpose of the study is to assemble new evidence about the introduction of consolidation reporting in Australia prior to 1961, and to relate that evidence to changes in regulatory requirements from differing sources, and of differing authority.

The opportunity is also taken to re-examine some of the claims made by Whittred about the influence of contracting procedures on the evolution of consolidated financial reporting.

Overall, the findings indicate that there are grounds to reject Whittred's claim that the emergence of a 'market for debt' was the *primary* (or even a *major*) factor encouraging consolidation accounting (1986), and his later claim that 'agency or contracting cost variables *overwhelmed all others in terms of explanatory power*' (1988, p. 5, emphasis added).

PRIOR RESEARCH

Whittred's initial (1986) study reviewed what were described as 'institutional reporting requirements' relating to the presentation of consolidated statements, and then related the frequency with which companies published consolidated statements at various points within the period 1920–53, to changes in those requirements. The findings were primarily based on a simple review of two sets of events: changes in reporting requirements, and changes in practice as observed by observations at different times.

However, given the data that emerges below, doubts must be expressed about the accuracy of Whittred's data concerning the frequency with which eligible companies initially adopted the practice of reporting via consolidated statements. Whittred collected evidence about consolidation practices in the states of New South Wales and Victoria only for the calendar years 1920, 1930–40 and 1953. Whittred indicated that he had presented figures which were 'intended' to reflect the proportion of companies which were presenting consolidated statements and which were entitled to do so (i.e., companies with subsidiaries). But Whittred was only able to record data regarding the number of companies which could 'unambiguously be identified as having subsidiaries'. Indeed Whittred acknowledged that he was likely to have understated the number of holding companies and hence overstated the proportion of consolidators in any given year.

Whittred (1986) then referred to data relating to the sources of finance for a sample of seventy-two Australian companies during the period 1935–53, as obtained from Keown (1954), whose findings had been published in a short-lived journal, the *Australian Accountancy Student*. This evidence was interpreted as indicating that the decade of the 1950s saw increasing reliance on debt as opposed to equity capital, and in particular, on publicly placed rather than private debt. The data from Keown's study of seventy-two companies—rather than data obtained from the balance sheets of consolidating companies—formed the basis of Whittred's suggestion that there were likely to have been changes in the information requirements of creditors which had shaped the practice of consolidation.

Whittred did not obtain or analyse these debt contracts, only quoting extracts from two 1950 prospectuses for the issue of unsecured notes. Both extracts referred to the financial position of the issuing company 'and its subsidiaries'. One might suppose that the agency argument would be stronger if such documents referred to the presence or otherwise of cross guarantees²—but neither did. Further, of course, these prospectuses would have been prepared by the issuing company, rather than potential lenders. However, Whittred suggested that they reflected information requirements of 'creditors'.

The evidence presented in Whittred (1986) was rather slight, though it was sufficient for the author to conclude that the evolution of consolidated reporting was a response to an increasingly sophisticated and innovative market for debt capital.

Whittred rejected (or least gave no credence to) the alternative hypothesis that practice had been shaped by regulatory influences, on three grounds. First, that some companies were consolidating before there was any institutional requirement to do so; second, that alternatives to the preparation of consolidated statements were available to holding companies (i.e., the presentation of separate accounts for each subsidiary); and third, because the degree of compliance with regulation has varied over time. Yet it is argued here these matters hardly provide sufficient grounds for rejecting the significance of regulation on the publication of consolidated statements. It is only to be expected that accounting practice would frequently predate 'regulation'. Regulatory requirements have often been described as a means of prescribing what has already been regarded as 'acceptable' (if not 'best') accounting practice. Moreover, many forms of regulation (including those in force during the period reviewed by Whittred) permitted a range of options. Moreover, some forms of regulation are less authoritative than others, or are not forcibly administered and enforced. Evidence that regulations permit a range of alternatives, or that there are variations in the degree of compliance with regulations, hardly indicate that regulatory requirements were of minimal influence.

Alternative approaches to assessing the significance of regulation would be to examine the extent to which regulatory requirements had led to changes in reporting practices; had standardized practice; had led to the disclosure of information

² The agency theory argument would suggest that companies would only be likely to consolidate companies linked by guarantees—since individual companies are regarded in Australian law as separate legal entities, and courts generally have refused to 'lift the veil' of incorporation to make holding companies or subsidiaries liable for the debts of an individual company. However, where a holding company and its subsidiaries had entered into cross guarantees, then consolidated statements could provide a broad indication of the ongoing capacity of those companies to repay debt. Even then, consolidated data would have to be interpreted with caution. For example, after modelling debt repayment scenarios in situations where a group of companies with both secured and unsecured debt became insolvent, Walker (1976) noted that the ultimate returns to lenders may depend on the sequence in which cross guarantees are enforced. This point has been extended in subsequent work (see Dean *et al.*, 1993). The broader point is that consolidated statements would be of limited usefulness to lenders where subsidiaries had entered into separate and autonomous arrangements with lenders, and had provided specific assets as security. In those situations, lenders would be more interested in the balance sheets and operating results of individual companies, and the current market values of assets provided as security for loans. Moreover, lenders would be in a position to demand special purpose reports, rather than rely on annual reports distributed to shareholders.

which might otherwise not have been made available; or had eliminated practices which had been regarded as unacceptable.

Whittred (1986) did not attempt to explain why any of the three factors listed above precluded the possibility that regulatory requirements of differing authority may have influenced accounting practice. However, companies which were preparing financial reports in Australia from the 1920s to the 1960s (the period reviewed in both Whittred's studies and this study) were subject to a complex array of regulatory requirements. Companies listed on Australian stock exchanges may have been incorporated in any one of Australia's states or territories, and as such would have been subject to different statutory requirements (at least until 1961 when an effort was made to develop 'uniform' companies regulations). Moreover, some listed companies were incorporated overseas, and hence were subject to the statutory reporting requirements of their place of incorporation. Further, the content of the listing rules of various Australian stock exchanges differed in significant respects.

In Whittred (1987) even stronger conclusions were reached about the significance of contracting practices in the evolution of consolidated financial reporting. Consolidation accounting, it was argued, had been adopted in order to reduce agency costs (p. 259). The theoretical argument supporting this analysis made little reference to the issue of why lenders would find that consolidated statements might be supposed to reduce agency costs. There is a range of situations where the data in consolidated statements would not be immediately relevant to the concerns of lenders. For example: loans might be secured by priority charges over specific assets, which provided adequate security; or a borrower's subsidiaries might not be wholly owned and may not have entered into guarantees to support the parent (see Walker, 1976 and fn. 2).

Whittred's 1987 paper repeated the historical background outlined in the 1986 paper though in far less equivocal terms. The 1986 paper had summarized this history as follows: 'such regulations as have been introduced have always provided management with the option of either consolidating or adopting some other form of financial reporting'. However, the 1987 paper referred to a 1938 Victorian statutory provision and a 1941 N.S.W. listing rule as the first consolidation *requirements* in those states. (The validity of these assertions is examined in more detail in the following section.) This enabled Whittred to present some evidence of the 'voluntary' use of consolidated statements (i.e., before these 'requirements' came into effect) in the period 1931–41. That evidence came from the reports of a small sample of ten companies (four incorporated in New South Wales and six in Victoria).

Whittred (1987) then outlined three hypotheses concerning the circumstances in which consolidation might be adopted for reporting purposes in order to minimize agency costs. These hypotheses indicated that the likelihood of the use of consolidation for external reporting was greater (a) in the presence of cross guarantees between parent and subsidiaries, (b) the smaller the management's relative share of the parent's equity, and (c) the greater the number of subsidiaries.

Evidence presented to test these hypotheses included case material concerning the circumstances of the ten 'voluntary consolidators', which was summarized as follows:

Consolidation followed closely (7/10 instances) a change in the underlying contracts in which the firms had entered. There were three instances of the creation of cross guarantees, one in which the writing of a management compensation plan tied to 'group' profits and the creation of cross guarantees occurred concurrently, two in which 'Articles of Association' were modified to require consolidation and one in which consolidation followed the writing of an agreement with preference shareholdings relating to participation in 'excess' profits. Changes in a firm's underlying contractual structure were in the majority of cases preceded by either, or both, a change in the firm's operating (5/7) or ownership (5/7) structure. (p. 274)

Since these case summaries were reproduced in detail in Whittred (1988), albeit for eleven rather than ten companies, it is possible to review the findings from alternative perspectives:

- Two of the eleven companies initially consolidated because of foreign regulatory requirements; the major shareholders of two other companies were domiciled overseas.
- None of the three cases described as involving 'cross guarantees' appears to have been properly described as such: they only involved one-way guarantees from parent to subsidiary. This was quite a different relationship from that which would be established by cross guarantees whereby a set of companies would be jointly and severally liable for the liabilities incurred by individual companies—as was noted in the discussion justifying the hypothesis (p. 264). On the other hand, one company did disclose existence of a mortgage covering a bank overdraft which was supported by cross guarantees.
- Only three companies reported a contingent liability arising from guarantees from the parent company to its subsidiaries. One of those involved disclosure in one year only, with no mention of it in either prior or subsequent years. The majority of cases (six) disclosed no contingent liabilities arising from guarantees.
- In all cases except one the subsidiaries were 100 per cent owned by the parent company. The exception wholly owned four subsidiaries, owned 75 per cent of two, and 50 per cent, 33 per cent and 25 per cent respectively of three further subsidiaries.
- Two 'voluntary consolidators' were incorporated in Victoria shortly before the enactment of the Victorian companies legislation which the author describes as the 'first Victorian requirement' for consolidation (and as such could have been influenced to consolidate by the impending legislation).
- The adoption of consolidation was linked in five of the eleven cases with debates about the merits of consolidation involving shareholders, auditors, parent companies, board members or local stock exchanges.

Unfortunately, in reporting these eleven cases, Whittred did not record when each of those firms obtained stock exchange listing, so that it is not possible to identify whether they were subject to listing rules which included the 'option' of consolidated reporting. However, it was revealed that the secretaries of the Sydney and Melbourne exchanges had earlier sought to persuade one of these 'voluntary consolidators' to abide by listing rules introduced after the company had been initially

admitted to listing (p. 155)—indicating that regulators were actively encouraging listed companies to adopt this practice.

Whittred's formal tests of his three hypotheses involved 'within group' comparisons of data relating to the ten 'voluntary consolidators', comparisons of data from parent companies' accounts for 'consolidators' and 'non-consolidators', and an examination of the effects of consolidation on published data. Findings were mixed. There was some support for the hypothesis that the incidence of consolidation would be associated with the number of subsidiaries—but while Whittred saw this as supporting his 'agency costs' argument, the same evidence could also be seen as supporting more simple propositions about the technical advantages of consolidated statements in communicating information to shareholders. It was not clear what evidence was the source of distinctions between 'owner controlled' and 'not closely held' companies but it appears that this was based on information reported about directors' shareholdings (rather than beneficial interests in shares, as is required in terms of contemporary corporations law). Other findings seem anomalous—particularly the finding that the 'voluntary consolidators' reported a significant increase in the ratio of secured debt to 'assets in place' (defined as book value of land, buildings, and plant and equipment). The presence of debt secured by charges over real property does not readily fit arguments about the need for lenders to monitor the financial performance of a set of companies linked by share ownership.

Nevertheless Whittred (1987) concluded (with due warning that his results need to be viewed with caution) that the evidence was generally consistent with his hypotheses. The paper's abstract and introduction characterized these findings far more strongly: as demonstrating that contracting practices played an important part in the evolution of financial reporting, since consolidated reporting reduced agency costs. Of course, the entire analysis made assumptions about the existence of lenders who were seeking consolidated data to monitor the firms' capacity to repay debt—a proposition which was itself questionable in light of the evidence provided by the case studies reported in Whittred (1988).

The conclusions of Whittred's agency-theory-based studies may be compared with findings from prior studies of the history of accounting practice in this area. A common theme of those studies was that regulation has played a role in encouraging the adoption of what was regarded as 'best practice'.

For example, Walker (1978) suggested that the introduction, acceptance and widespread adoption of consolidated statements in the U.K. as a means of reporting on the affairs of holding companies appear to have been 'responses to the inadequacy of customary procedures for asset valuation and revenue recognition to cope with inter-corporate shareholdings' (p. 113).

During the 1930s, consolidated statements came to be the preferred form of disclosure through a combination of factors: the enthusiasm for this form of reporting on the part of financial commentators, the well-publicised example of some large firms, and finally the intervention of the stock exchanges. (p. 117)

On the other hand, Walker suggested that in the U.S.A. (unlike the U.K., where corporate reporting was closely regulated by the requirements of company law)

the absence of regulatory constraints on corporate reporting prior to the 1930s 'may have been conducive to experimentation'. The introduction of tax legislation permitting the presentation of consolidated returns seems to have been a significant factor in widening the profession's awareness of consolidated statements (p. 220), since tax rules prompted an outpouring of material on the techniques of consolidation and led to an expansion of educational activities (p. 64). Support for the use of consolidated statements by banks came from the New York Stock Exchange which in 1919 introduced listing rules requiring the presentation of either consolidated statements or the separate statements of all 'constituent companies' (p. 210). Following the passage of the Securities Acts in the 1930s, the Securities and Exchange Commission (SEC) did not immediately promulgate formal rules requiring the inclusion of consolidated statements in documents filed for registration purposes, though it was suggested that the SEC may have been 'instrumental in extending the use of consolidated reports' through administration of its registration provisions (p. 242).

However, a distinction can be drawn between acceptance of the 'idea' of consolidation accounting (and preference for that form of disclosure), and widespread acceptance of the 'practice' (Bircher, 1988, p. 5).

Just as Whittred's (1986) study assembled sporadic evidence of Australian practice (much from secondary sources) in 1920, 1930–40 and 1953. Bircher reported on the use of consolidated statements in the years 1938–9, 1944–5 and 1947–8 by recourse to a sample of forty British companies. However, the two studies reached quite different conclusions about what factors were shaping practice.

Bircher concluded that, while a consensus on the desirability of consolidation accounting developed in Britain in the 1930s (p. 6), there was a substantial gap between the authoritative literature and practice. Consolidation accounting was not found to be widely adopted in Britain until the late 1940s, 'in the shadow of legislation to enforce more comprehensive dissemination of group accounting information by holding companies' (p. 12). While acknowledging other influences (primarily a 'substantial change in the perception of the nature of the shareholder' and changes in the nature of the corporate economy in the U.K. in that period), Bircher emphasized that impending state regulation was the dominant factor.

HISTORY OF AUSTRALIAN REGULATORY REQUIREMENTS FOR THE PROVISION OF CONSOLIDATED STATEMENTS

A chronology of major regulatory developments encouraging or requiring the use of consolidated reports is presented in Table 1. Fuller descriptions (though there is some conflict between these accounts) of these events have been provided by Gibson (1971), Walker (1978) and Whittred (1986).

As already noted, it appears that the first reporting requirement which recognized the preparation of consolidated statements was issued by the New York Stock Exchange around 1919 (Walker, 1978, p. 196). During the mid-1920s, representatives of U.K. stock exchanges argued unsuccessfully that the preparation of consolidated statements as supplements to the accounts of holding companies should be

TABLE 1

CHRONOLOGY OF AUSTRALIAN REGULATORY REQUIREMENTS ENCOURAGING
OR REQUIRING THE PRESENTATION OF CONSOLIDATED STATEMENTS

1925	Sydney and Melbourne Stock Exchanges required listed companies to provide balance sheets and profit and loss accounts of subsidiaries as supplements to the reports of holding companies.
1927	Melbourne Stock Exchange allowed the options of either presenting separate accounts of subsidiaries, or aggregate statements for subsidiaries, as supplements to the reports of holding companies.
1928	Sydney Stock Exchange also allowed use of aggregate statements 'of the company and subsidiaries' in lieu of separate statements of subsidiaries.
1936	Victorian Companies Act required 'group accounts' (usually presented as consolidated statements, but which could take the form of separate financial statements of subsidiaries).
1941	Sydney and Melbourne Stock Exchanges' listing rules amended to require newly listed companies to present supplementary consolidated statements or separate statements for subsidiaries.
1946	Listing rules became more authoritative as listed companies were required to sign a 'form of agreement' to abide by existing listing rules. ICAA issued 'Disclosure of the Financial Position and Results of Subsidiary Companies in the Accounts of Holding Companies', recommending use of consolidated statements 'or any other form [of presentation] as will enable the shareholders to obtain a clear view of the financial position and earnings of the group as a whole'.
1954	Listed companies required to abide by listing rules which may be introduced in future years.
1956	ASA issued 'Notes on the Preparation of Consolidated Statements' (without formally recommending the preparation of this form of report or conflicting with 'statutory provisions or stock exchange regulations as they now stand').
1961	Australian uniform Company Laws required holding companies to prepare group accounts covering all subsidiaries. Group accounts could take the form of consolidated statements, separate statements of subsidiaries, or a combination of consolidated statements and separate statements.
1966	Australian Associated Stock Exchanges required listed companies to provide notices of annual results in consolidated form.
1973	Australian Associated Stock Exchanges required annual accounts to be in consolidated form (unless alternative presentation approved by the exchange).
1990	Australian accounting profession issued accounting standard, AAS 24, <i>Consolidated Financial Statements</i> .
1991	Australian Accounting Standards Board issued AASB 1024, <i>Consolidated Accounts</i> , which (in terms of the 1991 Commonwealth Corporations Law) made the publication of consolidated statements mandatory for all companies which were parent entities in an economic entity which was a reporting entity.

mandatory—though members of a company law reform committee were unpersuaded (see Walker, 1978, pp. 69–75). However, Australian stock exchanges were quick to extend their listing rules to promote (if not prescribe) the use of consolidated statements in the late 1920s. In 1927 the Melbourne exchange's rules required supplementary disclosure of the separate accounts of subsidiaries, or aggregate statements encompassing (only) those subsidiaries. In 1928 the Sydney exchange modified this rule to require supplementary disclosure of a statement aggregating the accounts of a *holding company and its subsidiaries*.

It appears that these Australian stock exchanges were influenced by arguments advanced in the U.K. about the desirability of fuller disclosures about the affairs of the holding companies, which were becoming a more common form of business organization. The use of consolidated statements was comparatively rare. However, in 1923, a lecture to members of The Institute of Chartered Accountants in England and Wales by Sir Gilbert Garnsey had publicized the use of 'aggregate' balance sheets: Garnsey's lecture was reprinted at length in *The Accountant* (Garnsey, 1923a), and formed the basis of the first U.K. text on the subject (Garnsey, 1923b). British accounting texts and journals were distributed in Australia, and *The Accountant* in turn occasionally included references to the accounting practices of Australian companies. Moreover, articles from U.K. accounting magazines dealing with consolidated statements were frequently reprinted in local journals, notably the *Commonwealth Journal of Accountancy* and *The Public Accountant*. A review of later contributions from Australian authors to the debate about the merits of the use of consolidated statements (see, e.g., Nixon, 1928; Caldwell, 1929) clearly indicates that the earlier British literature was influential on Australian practitioners.

Whittred reported that the listing rules of the Sydney Stock Exchange were 'realigned' in 1936 with those of the Melbourne exchange (Whittred, 1986, p. 105)—in effect, eliminating the 'consolidation' option in favour of the presentation of a set of consolidated statements encompassing a holding company's subsidiaries (but excluding the parent). While no studies have recorded the impact of this change on reporting practices, it is apparent that soon afterwards, in 1938 the Victorian Companies Act was amended to prescribe that holding companies prepare group accounts—which were to take the form of either of the options prescribed by the Sydney exchange for the past ten years, that is, separate statements of subsidiaries, or a consolidated statement encompassing holding company and subsidiaries. In 1941, the two exchanges then reverted to the approach initially adopted by the Sydney exchange in 1928—requiring companies to provide either the separate statements of subsidiaries, or consolidated statements encompassing both holding company and subsidiaries.

The 1938 Victorian Companies Act was the first Australian statute to require the presentation of group accounts, which were usually presented as consolidated statements, although under certain circumstances separate statements of subsidiaries could be supplied in lieu. Other states followed, with Western Australia and Tasmania copying the Victorian approach in 1943 and 1959 respectively. Later, at the initiative of the Commonwealth government, all Australian states agreed to adopt uniform companies legislation and 1961 saw the universal adoption of requirements for holding companies to supplement their accounts with a set of 'group accounts' which continued to include the options of separate statements of subsidiaries, a consolidated statement encompassing subsidiaries, or the preparation of consolidated statements encompassing parent and subsidiaries—the options first set out by the Melbourne and Sydney Stock Exchanges in 1927 and 1928.

Strong encouragement for the use of consolidated statements in annual reports was provided—indirectly by amendments to listing rules in 1966 which required 'notices' to the market to include the following information:

the consolidated net trading results and provisions for depreciation and taxation and final net profit or loss of the company and of the company and its subsidiaries for each financial year (with comparison with the corresponding figures of the last preceding financial year) and stating whether such final result is audited or subject to audit. (AASE, 1966, p. 26)

This 1966 rule was, in effect, the first formal stock exchange listing rule to require consolidated reporting—prior rules had only related to annual reports, and had permitted holding companies to adopt a range of techniques in reporting on their investments in subsidiaries. It was reiterated in subsequent revisions, though later rules referred to these notices as ‘preliminary final statements’ (e.g., AASE, 1973, p. 67). By 1973 the AASE formally prescribed that published accounts shall be in consolidated form, ‘unless otherwise approved by the Exchange’ (AASE, 1973, p. 70).

To complete the chronology of regulatory provisions, reference must also be made to the activities of the accounting profession. Contributions to professional journals had included advocacy of the publication by holding companies of consolidated statements (e.g., Jenkinson, 1929) but it was not until 1947 that a professional body issued guidelines regarding consolidated statements. In 1946 The Institute of Chartered Accountants in Australia (ICAA) published five ‘Recommendations on Accounting Principles’. One of these was entitled ‘Disclosure of the Financial Position and Results of Subsidiary Companies in the Accounts of Holding Companies’. The text was virtually identical to a recommendation published in 1944 by The Institute of Chartered Accountants in England and Wales. It described three methods of disclosing ‘supplementary information’ about holding companies: to submit copies of the accounts of each of the subsidiary undertakings; to submit statements of the consolidated assets and liabilities and of the aggregate earnings of the subsidiary undertakings as distinct from those of the holding company; and to submit a consolidated balance sheet and consolidated profit and loss account of the holding company and of its subsidiary undertakings ‘treated as one group’.

In 1956, some ten years after the ICAA had issued some guidelines on the subject, the Australian Society of Accountants issued a statement entitled ‘Notes on the Preparation of Consolidated Statements’. In the preamble the Society reported that the notes had been prepared in response to the increased practice of presenting consolidated statements. The objective of the notes was to codify the main principles involved in preparing these reports.

There were no further pronouncements from the accounting profession on the subject of consolidation reporting in the 1950s, 1960s or 1970s, though the Australian Society of Accountants prepared an exposure draft, ‘Consolidated Financial Statements and the Practices of De-Consolidation and Non-Consolidation’ around 1969 (see *The Australian Accountant*, November 1969). While never publicly released, this exposure draft argued that partial consolidations or other forms of presentation failed to provide a ‘true and fair view’, and that full consolidated statements should be made compulsory. However, it was not until 1987 that the accounting bodies jointly formally published an exposure draft on the subject, leading later to the issue of an accounting standard AAS 24, *Consolidated Financial Statements*, in 1990. By this time, standards issued by the accounting profession

were of somewhat greater authority, both because they were less permissive and more tightly drafted, and because the ethical requirements of the profession obliged members to comply with professional standards. However, professional standards in turn were of lesser authority than standards issued by the Australian Accounting Standards Board, whose pronouncements effectively constituted regulations to the Commonwealth Corporations Law, and were mandatory. The profession's standard AAS 24 was soon reissued in slightly amended form by the Australian Accounting Standards Board as AASB 1024, *Consolidated Accounts* (1991). AASB 1024 formally made the preparation of consolidated statements mandatory for all firms which were subject to those standards. In the language of AASB 1024, it applied to all companies 'which were parent entities of an economic entity deemed a reporting entity'. AASB 1024 also followed the U.S.A.'s lead by removing the option of excluding so-called finance subsidiaries from the ambit of consolidation.

The issue of AASB 1024 also marked the end of the approach (pioneered by Australian stock exchanges in the 1920s and formally adopted in the Victorian Companies Act of 1938 and in legislation subsequently enacted in other states) of presenting 'group accounts' in different forms: either as a single set of consolidated statements, the presentation of separate financial statements of subsidiaries, the presentation of a consolidated statements encompassing subsidiaries (without the parent company), or through some combination of separate statements and consolidated statements. Further, the issue of AASB 1024 ensured that Australian parent companies with subsidiaries were required to present a consolidated statement encompassing *all* controlled entities—including unincorporated entities such as trusts.

From this examination of the history of regulatory requirements in Australia, it is clear that provisions relating to the preparation of consolidated statements were successively introduced and modified for decades before this form of reporting finally became mandatory in 1991. There has been a progression in regulatory requirements, in terms of (a) the narrowing of the options for modes of reporting, (b) the companies and entities those requirements have affected, and (c) the strength or authority of the regulatory requirements themselves.

In relation to the authority of regulatory requirements, it is emphasized that the successive provisions of Victorian, Western Australian and Tasmanian Companies Acts, and finally the 'uniform' legislation of 1961, did not formally prescribe the presentation of consolidated statements. Consolidation was only an available option.

Further, it must be recognized that stock exchange listing rules were of lesser coverage and lesser authority than statutory requirements. As discussed in Gibson (1971) and Whittred (1986), the listing rules of the exchanges initially only applied to companies which signed them on admission to listing—and even for those companies, were not strongly enforced. The 1946 amendments somewhat strengthened the authority of listing rules, by requiring companies to undertake to abide by the rules in force at the time of their listing. It was not until 1954 that the rules of the Sydney and Melbourne exchanges were amended to require companies to abide by not only the rules in force at the time of their listing, but to any subsequent amendments.

Against this background, a central concept in Whittred's analysis of factors shaping accounting practices was his identification of certain regulatory provisions as the first *requirements* for this form of reporting, and consequently his assertions that some firms had *voluntarily* introduced consolidated reporting before those so-called requirements were introduced. Whittred asserted that 'a consolidation requirement did not appear in N.S.W. until the 1941 revision of the Sydney Stock Exchange Listing requirements—and again it appeared as an option' (1986, p. 106).

Reiterating, the 1928 Listing Rules of the Sydney Exchange *had* required the preparation of 'aggregate' financial statements encompassing a holding company and subsidiaries—in substance, the same requirement as embodied in the 1941 listing rules, even though the former did not use the term 'consolidated' or 'consolidation'. The significance of these 1928 requirements had previously been noted by Gibson (1971) and Walker (1978), both cited by Whittred (1986).

Possibly, Whittred was diverted by the changing terminology. Yet in the 1920s, the terms 'consolidated statement' and 'combined statement' and 'aggregate statement' were used as synonyms—with the latter term being used in Garnsey (1923b), and in 1925 in submissions to the U.K. Greene Company Reform Committee during its deliberations (see Walker, 1978). Gibson (1971) had also described the early presentation of 'aggregate' financial statements by several Australian companies in 1932–6, and had attributed these presentations to the efforts of the Sydney and Melbourne exchanges to secure improved reporting by listed companies (p. 76). Indeed, Whittred (1988) included a case study of a 'voluntary' consolidation in which the reporting entity had provided an 'aggregate' balance sheet and profit and loss account (p. 169).

Further, Whittred claimed that 'a consolidation requirement did not appear in N.S.W. legislation until July 1962 when the N.S.W. Companies Act, 1961, became effective' (1986, p. 108). Yet, strictly, the 1961 N.S.W. legislation did not *prescribe* the preparation of consolidation for N.S.W.-incorporated companies: it merely prescribed the preparation of 'group' accounts. Group accounts could take a variety of forms, of which the presentation of consolidated statements became the most popular.

ASSESSING THE INFLUENCE OF REGULATION

A detailed study of the reporting practices of the entire population of 779 non-mining companies listed on the Sydney Stock Exchange as at 1 January 1958 was undertaken in order to assess the influence of regulation on reporting practices. The pre-1958 observation period was chosen in the light of findings by Bircher (1988) that pending U.K. legislation had influenced U.K. use of consolidation accounting. Hence the examination of published reports preceded 1961 changes to the N.S.W. Companies Act which introduced requirements for the preparation of 'group accounts', and hence encouraged the use of consolidation accounting by listed companies with subsidiaries. However, the study also had regard to the effect of other forms of regulation, including guidelines issued by the profession, stock exchange listing rules and interstate or overseas statutory requirements affecting listed companies incorporated outside the state of New South Wales.

As outlined in Table 2, the review proceeded in four steps.

Step 1 involved determining which of the 779 listed companies were holding companies at 1 January 1958, or acquired subsidiaries shortly afterwards, and so were in a position to prepare consolidated statements. A review of the files of the Sydney Stock Exchange and microfiche copies of annual reports held by the Australian Graduate School of Management, University of New South Wales, identified 182 companies with no subsidiaries. The reporting practices of the remaining companies were examined over the period 1958–64, and it was found that of the 597 companies identified as having subsidiaries during 1958–64, twenty-three were not consolidating in 1958 but either sold their subsidiaries or were themselves reduced to subsidiary status after a successful takeover bid. That left a reduced sample of 574 companies which were ‘potential consolidators’. Of these, thirty-eight companies were not holding companies in 1958, but acquired subsidiaries during 1958–64 and thereafter produced consolidated statements. As such they could be regarded as having consolidated under a ‘regulatory influence’, but since they did not have a choice of ‘voluntarily consolidating’ at an earlier date, were excluded from subsequent analysis, to provide a reduced pool of 536 listed companies which were ‘potential consolidators’ in 1958.

Step 2 examined the place of incorporation of these 536 companies, using data from *Jobson's Year Book*. It was found that no fewer than 117 (22 per cent) of these companies were incorporated outside New South Wales in jurisdictions which already prescribed the use of consolidation accounting. Most were from Victoria (111), with the other six incorporated in Tasmania, Western Australia, England or New Zealand.

Step 3 involved the identification of when the remaining 419 ‘potential consolidators’ initially used consolidated statements. If they began consolidating during the review period 1958–64, it was reasonable to conclude immediately that they had done so in response to the changes embodied in the 1961 uniform Companies Acts enacted throughout Australia: they could be categorized as ‘regulatory influenced’ rather than ‘voluntary consolidators’. Analysis indicated that, of the 419 companies, 330 (79 per cent) began consolidating prior to 1958, and eighty-three (20 per cent) began consolidating in response to changes in company law, while six (1 per cent) produced separate statements for subsidiaries rather than consolidated statements. That is, one in five of all companies that were technically in a position to adopt consolidated accounting but were not legislatively required to do so did not consolidate until influenced by statutory requirements introduced in 1961.³ However, 79 per cent of companies which began consolidating earlier were not necessarily ‘voluntary consolidators’, since listed companies were expected to comply with stock exchange listing rules (though as indicated above, these were not regarded as authoritative until later years).

Hence, in Step 4 the dates on which companies were first listed on Australian stock exchanges were obtained from the *Sydney Stock Exchange Gazette*. The listing

³ Those companies which had subsidiaries at 1958 but chose not to consolidate have been excluded from these calculations.

TABLE 2

INFLUENCE OF STATUTORY AND OTHER REGULATORY REQUIREMENTS ON CONSOLIDATION PRACTICES OF COMPANIES LISTED ON THE SYDNEY STOCK EXCHANGE AT 31 JANUARY 1958

Regulatory event	Vic. Companies Act established consolidation as an option	Sydney and Melbourne stock exchanges introduced consolidation option	W.A. Companies Act aligned with Vic.	Stock exchanges strengthened listing rules; ICAA issued recommendations	ASA issued 'Notes on consolidation'	Tas. Companies Code aligned with W.A. & Vic.	Uniform Companies Code included consolidation option	Aust. Assoc. Stock Exchange requires consolidated reports of results	Accounting profession issued AAS 24 requiring consolidated statements
	1936	1941	1943	1946	1956	1958	1961	1967	1990
All non-mining companies listed on Sydney Stock Exchange 1 January 1958									
779									
Step 1 Determine holding company status during review period (1958-64)	Companies with no subsidiaries				Holding companies in 1958 but status changed ^a	Holding companies 1958-64 (potential consolidators)			
	182				23	574			
Step 2 Exclude companies already publishing consolidating statements in 1958 in compliance with interstate or foreign legislative requirements					Companies not subject to any legislative requirements	Companies incorporated in Vic., W.A., Tas., England or N.Z.	Companies acquiring subsidiaries and consolidating during review period		
					419	117	38		
Step 3 Identify when potential consolidators initially used consolidated statements					Began consolidating before 1958		Began consolidating during review period		Presented separate statements for subsidiaries
					330		83		6
Step 4 Examine listing dates of consolidating companies	regulatory influenced								
40 pre-1928 voluntary consolidators	15 1928-41 regulatory influenced	8 1941-6 regulatory influenced	267 post-1946 regulatory influenced						
54 pre-1941 regulatory influenced	4 1941-6 regulatory influenced	25 post-1946 regulatory influenced							

^a Either sold subsidiaries or were themselves taken over during 1958-64.

REGULATORY INFLUENCE ON CONSOLIDATED ACCOUNTING

dates were grouped in bands, corresponding with changes in listing rules relevant to the application of consolidation accounting:

<i>Year of initial listing</i>	<i>Regulatory requirements</i>	<i>Classification of companies if they began consolidating:</i>	
		<i>before 1958</i>	<i>after 1958</i>
Pre-1928	No regulatory requirements	Voluntary consolidator	Regulatory influenced
1928-40	1928 Sydney Stock Exchange listing rule 'encouraged' consolidation	Voluntary consolidator	Regulatory influenced
1941-6	After stock exchanges encouraged consolidation, but before listing rules strengthened, and before ICAA issued recommendations. Complicance with listing rules virtually optional	Regulatory influenced	Regulatory influenced
Post-1946	After listing, rules strengthened and became applicable to all listed companies	Regulatory influenced	Regulatory influenced

The findings from this analysis are presented in Table 2, while Table 3 disaggregates the data further to indicate the place of incorporation of the companies which published consolidated statements.

The findings as set out in Table 2 indicate that regulations affecting the preparation of consolidated statements have become more prescriptive and authoritative over time. Further, the evidence indicates that the wider adoption of consolidation accounting has been associated with changes in statutory and other forms of regulation.

Of the 574 companies which were holding companies in the period 1958-64, only fifty-five (9 per cent) could be identified as having voluntarily adopted consolidation accounting in the absence of any regulatory requirement to do so. Of these, forty

TABLE 3
ANALYSIS OF LISTING DATES OF POTENTIAL CONSOLIDATORS

Listing dates	Began consolidating during review period	Began consolidating before 1958		Totals
		N.S.W.	Other	
Pre-1941	54	49	6	109
1941-6	4	7	1	12
Post-1946	25	245	22	292
Totals	83	301	29	413 ^a

^a Excludes six companies which chose to present separate statements for subsidiaries.

(7 per cent) were listed before the release of the 1928 stock exchange listing rule encouraging consolidation. On the other hand, 91 per cent of the companies eligible to use consolidated statements appear to have only done so in response to regulatory requirements of some form.

The findings also indicate that compliance with regulatory requirements was affected by the *authority* of those requirements. As stock exchange listing rules shifted from a voluntary code of practice to a set of mandatory requirements, so too did the degree of compliance with those regulations. Of the companies which were consolidating prior to 1958, 83 per cent were listed after 1941 (when the stock exchanges encouraged reporting via consolidated statements) and 81 per cent were listed after 1946 when the listing rules were strengthened.

To assess whether the authority of regulatory requirements influenced practice, an analysis was undertaken of the dates on which companies which were first-time consolidators after 1958 were first listed on a stock exchange.

Of the eighty-three companies which first consolidated after 1958, fifty-four had been listed since before 1941, when the Sydney Stock Exchange first introduced a listing rule requiring companies to either provide consolidated statements or to provide separate statements for its subsidiaries. It had taken more than fifteen years for these companies to elect to use consolidated statements. They only started presenting consolidated statements when it was clear that this form of reporting practice would be prescribed by forthcoming changes in company laws.

Further, legislative requirements were plainly more authoritative than the listing rules. No fewer than eighty-three companies in a pool of 419 which were not operating under any statutory requirements to consolidate but which were eligible to do so—around one in five—did not do so until after 1958, in the face of changes in company law. Of the companies which switched to consolidation during the review period, 66 per cent of them were listed before 1941 and 70 per cent of them were listed before 1946 when compliance with stock exchange regulations was, at best a matter of honour.

ALTERNATIVE HYPOTHESES CONCERNING INCENTIVES FOR CONSOLIDATION

As indicated above, Whittred (1886, 1987) dismissed the significance of regulation as a factor encouraging consolidation, and suggested that the primary factor driving the wider use of consolidation accounting was a response to private contracting between companies and their debtholders to minimize agency costs. The wider use of consolidated statements was attributed to the increasing reliance of listed companies on debt, and it was inferred that the very existence of higher levels of debt meant that there were contractual arrangements which might have included requirements for the preparation of consolidated statements.

However, the findings presented above provide strong evidence that regulation (and the strength of individual sources of regulation) have influenced the use of consolidation accounting by Australian companies. This section addresses the alternative argument that the dominant influences shaping consolidation practices

were the monitoring arrangements established by debtholders. It relies on evidence obtained from primary sources—including data obtained from a direct examination of the balance sheets of listed companies around the time that they first published consolidated statements. Particular attention was directed to the nature of the ‘debt’ reported by those companies, and whether the evidence adequately supports Whittred’s assumption that high levels of debt would be accompanied by contractual and monitoring arrangements by debtholders. Whittred also assumed that the presence of debt contracts containing cross guarantees could be inferred from changes in the gearing of listed companies and the extent of ownership of subsidiary companies.

The examination of regulatory changes reported above indicates that, strictly, only companies listed before 1928 can be properly classified as companies which ‘voluntarily’ consolidated. However, for the purpose of examining the debt characteristics of companies when they initially published consolidated statements, and in order to more closely replicate Whittred’s analysis, companies were classified as ‘voluntary consolidators’ if they adopted consolidation accounting and had been listed prior to 1941, before stock exchange rules encouraged consolidation and before those rules were strengthened. That enabled the identification of two groups of companies: (a) those that were ‘voluntary consolidators’ (in terms of the pre-1941 listing test); and (b) those that did not adopt consolidation accounting until 1958–64, under the influence of the Uniform Companies Code.

Whittred’s analysis would suggest that the gearing of ‘voluntary consolidators’ would be different from the gearing of companies which only adopted consolidation in response to regulation. Voluntary consolidators had responded to an incentive. For example, a company which had very low levels of debt compared to equity would not be likely to face a strong incentive to consolidate in response to the needs of debtholders compared to one that had high debt levels and was therefore more dependent on debt. This suggests the following hypothesis:

- H1: That the proportion of debt to equity of voluntary consolidators was no different from that of regulatory influenced companies which published consolidated statements.

The companies’ reports were then further examined to determine whether there was any relationship between the type of debt held and their consolidation status. Under Whittred’s positive-incentives scenario it would be expected that companies carrying *unsecured* long-term debt would be more likely to consolidate. There could be a greater incentive for debtholders who do not have some sort of collateral protection to demand monitoring activities from the shareholders of a firm. Conversely, those creditors who have security do not require any further accounting or indeed would not require any constraints on the company. There is no incentive for the introduction of costly monitoring activities in this instance. One would expect therefore that companies carrying a larger proportion of unsecured debt would be more likely to be susceptible to debtholder pressure to supply consolidated statements. The existence of borrowings from subsidiaries might be especially likely to

encourage debtholders to seek the establishment of monitoring arrangements which would examine consolidated data. Four testable propositions emerge:

- H2: That the presence of bank loans (*overdrafts*) and *consolidating status* are independent.
- H3: That the presence of *loans on mortgage* and *consolidating status* are independent.
- H4: That the presence of *loans from subsidiaries* and *consolidating status* are independent.
- H5: That the presence of *unsecured notes and debentures* in the balance sheet of the parent company was independent of *consolidating status*.

Hypothesis 1 was tested by measuring gearing for companies in the two categories. Debt was taken to be inclusive of provisions. The data were taken from the accounts of parent companies in the year in which consolidated statements were first published. Traditional debt/equity ratios were chosen as measures of gearing because the intensity of incentives to adopt consolidation accounting might be supposed to be related to the relative positions of debt and equity as stakeholders (rather than an absolute level of debt). In terms of Whittred's chosen agency theory framework, it seems more appropriate to suggest that the more highly geared a company, the more likely it would be subjected to pressure to provide consolidated statements. This is in contrast to Whittred's (1987) study in which 'leverage' and a measure representing the proportion of wholly owned subsidiaries were employed as *proxies* for the presence of cross guarantees, as the author was not always able to establish 'unambiguously the existence of cross guarantees' (Whittred, 1987, p. 271).

Of a set of eighty-three 'regulatory influenced' companies (i.e., those companies that switched to consolidation in response to 1961 amendments to company law), data were unavailable for four companies and one banking company was omitted, because bank financial statements were then highly abbreviated, and also because the gearing of banks means that their capital structure could not reasonably be compared with other companies in the sample. This left a sample of seventy-eight 'regulatory influenced' companies. For the fifty-five 'voluntary consolidators', five companies were omitted as they were pre-1941 consolidators (before the supposed changing market for debt). Six companies were also omitted because data were unavailable and two banking companies were omitted for the reason outlined above. This left a sample size for the 'voluntary consolidators' (using Whittred's definition of voluntary reporting) of forty-two firms.

The results as shown in Table 4 indicate that the hypothesis that there is no difference between the gearing of voluntary consolidators and those of regulatory influenced consolidators is supported. In fact, in terms of three gearing measures used, 'regulatory influenced' companies actually had higher (mean) levels of debt than 'voluntary consolidators'—contrary to the agency argument which suggests that the reverse should have applied.

REGULATORY INFLUENCE ON CONSOLIDATED ACCOUNTING

TABLE 4
COMPARISON OF GEARING

	Regulatory influenced (<i>n</i> = 78)			Voluntary consolidators (<i>n</i> = 42)			<i>t</i> score
	Mean	Median	<i>SD</i>	Mean	Median	<i>SD</i>	
Total debt/equity	0.8115	0.4608	1.2511	0.5637	0.4069	0.5122	1.2275
Long-term debt/equity	0.2718	0.0019	0.8000	0.1249	0.0120	0.1991	1.1636
Long-term debt and bank loans/equity	0.3330	0.0966	0.7896	0.2463	0.1250	0.3382	0.6779

Note: Critical *t* scores with α at .01 and *df* 118 are $t = \pm 2.618$.

TABLE 5
COMPARISONS OF GEARING: 'REGULATORY INFLUENCED' CONSOLIDATORS

	Year of consolidation			Year prior to consolidation			<i>t</i> score
	Mean <i>n</i> = 78	Median	<i>SD</i>	Mean	Median	<i>SD</i>	
Total debt/equity	0.8115	0.4608	1.2511	0.7756	0.5895	1.1689	-1.0449
Long-term debt/equity	0.2718	0.0019	0.8001	0.2403	0.0157	0.8812	-1.2886
Long term debt and bank loans/equity	0.333	0.0966	0.7896	0.3281	0.1346	0.8975	-0.5590

Note: Critical *t* scores with $\lambda = 0.01$ and *df* = 77 are $t = \pm 2.641$.

A matched pairs test was then performed to compare the gearing of regulatory influenced companies in the year of consolidation and in the year immediately prior to consolidation. The findings reported in Table 5 indicate that there was no statistically significant difference in debt/equity ratios between those years.

Types of Debt

The nature of reported debt was examined in some detail, since only some types of debt are likely to give rise to demands from creditors for the establishment of monitoring arrangements.

Whereas Whittred had assumed that high leverage was a proxy for the existence of cross guarantees, the Table 6 evidence obtained from inspection of the balance sheets of first-time consolidators shows that the most common form of borrowings was through loans secured by mortgages or other charges. The results from testing the four hypotheses (H2-H5) suggested in the previous section are shown in Table 7.

The only hypothesis rejected at the 1 per cent level is that relating to unsecured notes and debentures. The chi-square test indicates that there is a statistically significant relationship between the existence of unsecured notes and debentures and

TABLE 6
TYPES OF DEBT HELD

Type of debt	Regulation-influenced consolidators (n = 78)	Voluntary consolidators (n = 42)
Bank loans (overdrafts)	19	8
Secured bank loans (overdrafts)	29	19
No bank loans (overdrafts)	<u>30</u> <u>78</u>	<u>15</u> <u>42</u>
Loans on mortgage	25	14
No loans on mortgage	<u>53</u> <u>78</u>	<u>28</u> <u>42</u>
Debt owing to subsidiaries	35	18
No debt to subsidiaries	<u>43</u> <u>78</u>	<u>24</u> <u>42</u>
Unsecured notes	20	1
Debentures	11	4
No debentures or unsecured notes	<u>47</u> <u>78</u>	<u>37</u> <u>42</u>

TABLE 7

Hypotheses	Critical χ^2 value	χ^2 value
H2: That the presence of bank loans (<i>overdrafts</i>) and <i>consolidating status</i> are independent	< 9.21	0.8409
H3: That the presence of <i>loans on mortgage</i> and <i>consolidating status</i> are independent	< 6.63	0.0204
H4: That the presence of <i>loans from subsidiaries</i> and <i>consolidating status</i> are independent	< 6.63	0.0449
H5: That the presence of <i>unsecured notes</i> and <i>debentures</i> are independent of <i>consolidating status</i>	< 9.21	11.9205

the consolidating status of the company. However, contrary to what might have been expected in light of Whittred's arguments, companies which had issued unsecured notes or debentures were more likely to be 'regulation influenced' consolidators. In other words, these companies were more likely than others to have not voluntarily published consolidated statements, but to have waited until there was a regulatory requirement before adopting that practice.

A preliminary investigation was undertaken to assess whether there had been material changes in the nature of borrowings during the observation period of 1955–65. In Table 8 the period 1955 to 1965 was partitioned into two five-year phases and the balance sheets of companies which first consolidated in those two phases (irrespective of whether they were voluntary consolidators or not) were compared.

REGULATORY INFLUENCE ON CONSOLIDATED ACCOUNTING

TABLE 8

DEBT INSTRUMENTS ISSUED BY LISTED COMPANIES

	Unsecured notes	Debentures	No debt instruments	Total
1955-60	14	4	28	46
1961-5	10	5	31	46

The formal hypothesis examined was:

H6: That the incidence of borrowings through *unsecured notes and debentures* was independent of the *time periods 1955-60 and 1961-65*.

However, the evidence ($\chi^2 = .9303$; critical $\chi^2 = < 9.21$) did not support the hypothesis—or Whittred's claims that the wider use of consolidated statements reflected greater reliance on debt finance during the 1950s and 1960s.

SUMMARY AND DISCUSSION OF FINDINGS

This article presents new evidence about the pattern of introduction of consolidation reporting in Australian accounting practice prior to 1961, and relates that evidence to changes in regulatory requirements. Whereas prior studies relied on sampling techniques for evidence of changes in reporting practices, this study examined the population of non-mining companies listed on the Sydney Stock Exchange as at January 1958, and identified when they first used consolidated statements. This evidence was related to the chronology of regulation permitting or prescribing the use of consolidated statements. Regulatory changes since the 1920s progressively narrowed options for modes of reporting, extended the range of companies and entities to be encompassed by consolidated statements, and strengthened the authority of the regulatory requirements themselves.

Prior studies by Whittred (1986, 1987) have erred in their identification of 1941 amendments to the listing rules of the Sydney Stock Exchange as constituting the first *requirements* for the publication of consolidated statements—despite referring to prior publications which made clear that these listing rules only made consolidation an optional form of reporting. In fact, the first regulations to require publication of consolidated data were the 1966 amendments to the listing rules of the AASE which required notices to the market (later termed 'preliminary final statements') to present consolidated data. On the other hand, regulatory requirements in place since 1928 have progressively *encouraged* the presentation of consolidated statements, by making this form of reporting an optional or a favoured presentation.

Thus, very few listed companies could be said to have 'voluntarily' presented consolidated statements independently of regulatory influences. Indeed, contrary to suggestions made in prior studies, it was found that only around forty of the 779 companies listed in 1958 (i.e., 5 per cent) could be said to have 'voluntarily' presented consolidated statements, rather than to have been subject to the effect of regulations.

However, it is also significant that in this area of accounting, practice preceded regulatory requirements, albeit to a limited extent.

The evidence presented here suggests that compliance with regulatory requirements was clearly related to the *authority* of those regulations. Plainly, statutory requirements have been more influential than listing rules of the stock exchanges, and more influential than professional recommendations at a time when these lacked legal backing. At the same time, the history of the profession's activities suggests that it played a leading role in disseminating knowledge about the techniques of consolidated statements—through lectures, professional literature, and examination requirements.

The findings of this study also contradict claims that the emergence of a 'market for debt' was the primary factor encouraging consolidation (Whittred, 1986), that consolidated statements were introduced to reduce agency costs (Whittred, 1987), and that 'agency or contracting cost variables overwhelmed all others in terms of explanatory power' (Whittred, 1988).

The most basic flaw in Whittred's analysis was the misrepresentation of 1941 listing rules as *requiring* the preparation of consolidated statements—which led to basic misdescription of the practices of a firm as having presented consolidated statements either 'voluntarily' or in response to regulatory requirements.

The hypotheses outlined in Whittred's studies were unexceptional, though the evidence presented as 'testing' those hypotheses involved some dubious proxies for what were described as 'agency or contracting cost variables'. For example, Whittred did not present any evidence of contractual relationships established by lenders, but simply speculated that the 'emergence of a market for debt' may have led lenders to seek to monitor the performance of holding companies and subsidiaries through consolidated statements.

Whittred's reliance on secondary sources for evidence (rather than on direct inspection of the accounts of companies publishing consolidated statements) meant that his creative speculations were unquestioned. Interpretations of findings based on data assumed to be proxies for other variables effectively elevated those speculations to the status of *assumptions*. High levels of debt were assumed to mean that there was a high incidence of contractual arrangements established by lenders. Evidence of lending between holding companies and subsidiaries was assumed to mean that those companies had established cross guarantees, which in turn (it was further assumed) would make consolidated statements a relevant source of data to lenders intent on minimizing agency costs.

Putting the logic of that reasoning aside, inspection of the balance sheets of first-time consolidators revealed that any supposed 'increasing reliance on debt' (if valid) was commonly associated with asset-based lending, with borrowings commonly being secured by charges over real property. That form of lending would hardly inspire lenders to seek to establish monitoring arrangements based on the presentation of consolidated statements. Further, so-called 'voluntary consolidators' did not record greater reliance on debt than other firms which later published consolidated statements only because of the introduction of regulations; there was no discernible trend in reliance on debt instruments which established formal contractual arrangements

for monitoring; and the capital structure of 'voluntary consolidators' was not significantly different from the capital structure of other companies which presented consolidated statements in the face of changes in regulations. All in all, the evidence obtained from primary sources did not lend any support to explanations of the use of consolidated statements based on 'agency or contracting cost variables'.

Rather, the findings of this study of reporting practices are consistent with prior interpretations of the history of reporting practices in this area (Gibson, 1971; Walker, 1978; Bircher, 1988), which suggest that the adoption of consolidated accounting reflected a range of factors, including the growing acceptance of the technique of consolidated financial reporting by practitioners, and by professional bodies.

Some final observations underline this point. While The Institute of Chartered Accountants and the Australian Society of Accountants made their first pronouncements on the subject of consolidations in 1946 and 1956 respectively, that did not mean that the majority (or even many) practitioners were familiar with the techniques of consolidation. Indeed, it was not until 1953 that questions on consolidation accounting first appeared in examination papers set by the Institute (in the subject 'advanced accounting'). Thereafter, textbooks used in Australia often provided basic information about the concepts and techniques of consolidations, and this practice continued until the 1970s when the author of one leading text 'felt able to omit much introductory material since the basic principles and concepts of group accounts are now widely understood' (Shaw, 1973).

The use of consolidated statements during the 1950s was still sufficiently novel for practitioners to remark on their publication. Trigg (1957), in an address to the Australian Accountant's Research Society (South Australian Division) at the annual congress, noted:

Each year we find a new crop of consolidated accounts appearing, and I venture to suggest that practitioners are making a valuable contribution in the public interest by persuading directors that adequate information can only be given to shareholders by supplementing the separate accounts of the holding company with consolidated accounts.

Comments like these underline the emphasis by practitioners on providing information to *shareholders* (for more on this point, see Walker, 1978). Indeed, the annual reports of companies in the year they first presented consolidated statements often referred to changed regulatory requirements, and to directors' concern to provide improved information to shareholders. For example, one company reported that the 'aggregate Balance Sheet of the company and its Subsidiary Companies . . . will give shareholders a picture of the expansion and progress of the Corporation during the past twelve months' (Consolidated Finance Ltd, 1946); another claimed that 'a consolidated statement . . . would more clearly show to shareholders the actual results and position of the business' (York Motors Ltd, 1952).

One could argue that there were other influences on the popularization of consolidated statements. Whereas companies may once have managed their operations through a branch or divisional structure, increasing size, increasing diversity in operations and internationalization of business operations, all seem to have contributed

to the evolution of more complex corporate structures. These factors seem to have been particularly evident from the middle of this century. Businesses would have needed consolidated statements for their own internal purposes, and this could have spilled over to external reporting.

In the face of increasing complexity in business structures, the accounting literature included more discussion about the virtues of consolidated statements as a means of reporting to a range of stakeholders, and practitioners in turn may have been influenced by arguments expressed in an emerging literature. Indeed, it may be that the eventual popularization of consolidation accounting followed from a greater awareness on the part of practitioners about how to compile these reports.

It may also be that accounting practices were influenced to some extent by the interests of lenders—but equally, it is possible that any debt contracts that were written (say) after the 1950s were written in terms of consolidated statements for no other reason than that knowledge about the techniques was now more widely available. Knowledge of the technique led to its being used.

Undeniably, changes in regulation were associated with changes in practice—but changes in regulatory requirements appear to have led to greater emphasis on the techniques of consolidation in programs of accounting education.

In summary, the emergence and eventual popularization of consolidation accounting may well have been shaped by a complex set of factors—including changing commercial practices, regulatory requirements, education programs, and the force of ideas. The evidence presented here shows that changing regulatory requirements relating to the presentation of consolidated statements were followed by greater use of consolidated statements in external reporting. When stated baldly, that finding may not seem remarkable. However, it contradicts prior claims that the interest of lenders (through ‘contracting’) was a more significant influence on practice in the use of consolidated statements than was regulation.

It would be simplistic to suggest that there was a one-way causal relationship between specific variables. Yet such a relationship is reflected in Whittred’s claims about the history of the use of consolidated statements in Australian accounting practice: lenders demanded the inclusion of clauses in contracts to ensure the provision of consolidated data, which in turn led corporations to publish that form of information.

It would be just as simplistic to suggest that there were causal relationships between the contributions of accounting writers, regulation, and practice—even though this sequence of events seems to provide a better explanation of the history of consolidation practice in Australia.

Whittred’s claims were based on an analysis in which the principal flaws were an undue reliance on secondary sources of evidence, an apparent failure to recognize that Sydney listed companies may have been subject to regulations established in other jurisdictions, and a crucial misinterpretation of the history of Australian stock exchange listing rules, which led to the misidentification of listed companies as having adopted consolidation independently of regulation. The findings of the present study also underline comments made previously in critiques of other papers which have tested hypotheses incorporating agency or contracting costs. As Merino

et al. (1987) noted, the 'classification of events require judgments' and 'historical analysis provides a mechanism for ensuring that those judgments are made on an informed basis'. Mills (1990, p. 63) observed that those who seek to rely on historical evidence in the development of theories should use that evidence 'with particular care, with full consideration for the contextual factors that give it life'.

REFERENCES

- Aitken, M. J., and J. A. Loftus, 'Determinants of Accounting Policy Choice in the Australian Property Industry: A Portfolio Approach', *Accounting and Finance*, November 1994.
- American Accounting Association Financial Accounting Standards Committee, 'Response to the FASB Exposure Draft, "Proposed Statement of Accounting Standards—Consolidated Financial Statements: Policy and Procedures"', *Accounting Horizons*, September 1996.
- Australian Associated Stock Exchanges, *Listing Rules*, AASE, 1966.
- , *Listing Rules*, 1973.
- Bircher, P., 'The Adoption of Consolidated Accounting in Great Britain', *Accounting and Business Research*, Winter 1988.
- Caldwell, S. M., 'The Accounts of Holding Companies', *The Commonwealth Journal of Accountancy*, 1 March 1929.
- Dean, G. W., P. F. Luckett and E. Houghton, 'Notional Calculations in Liquidations Revisited: The Case of the ASC Class Order Cross Guarantees', *Company and Securities Law Journal*, August 1993.
- Francis, J. R., 'Debt Reporting by Parent Companies: Parent-Only Versus Consolidated Statements', *Journal of Business Finance and Accounting*, Autumn 1986.
- Garnsey, G., 'Holding Companies and their Published Accounts', *The Accountant*, 6 January 1923a.
- , *Holding Companies and their Published Accounts*, Gee & Co., 1923b.
- Gibson, R. W., *Disclosure by Australian Companies*, Melbourne University Press, 1971.
- Hagerman, R. L., and M. Zmijewski, 'Some Economic Determinants of Accounting Policy Choice', *Journal of Accounting and Economics*, April 1979.
- Heian, J. B., and J. B. Thies, 'Consolidation of Finance Subsidiaries: \$230 Billion in Off-Balance-Sheet Financing Comes Home to Roost', *Accounting Horizons*, March 1989.
- Jenkinson, M. W., 'The Value of a Balance Sheet', *The Public Accountant*, 29 April 1929.
- Keown K. C., 'The Capital Structure of Australian Companies', *Australian Accountancy Student*, September 1954.
- Lemke, K., and M. J. Page, 'Economic Determinants of Accounting Policy Choice: The Case of Current Cost Accounting in the U.K.', *Journal of Accounting and Economics*, March 1992.
- Merino, B., B. S. Koch and K. L. MacRitchie, 'Historical Analysis—a Diagnostic Tool for "Events" Studies: The Impact of the Securities Act of 1933', *The Accounting Review*, October 1987.
- Mills, P. A., 'Agency, Auditing and the Unregulated Environment: Some Further Historical Evidence', *Accounting, Auditing and Accountability Journal*, Volume 3, No. 1, 1990.
- Nixon, E. V., 'Holding Companies', *The Commonwealth Journal of Accountancy*, 1 August 1928.
- Shaw, J. C., ed., *Bogie on Group Accounts*, Jordan & Sons, 1973.
- Trigg, F. E., 'Some Thoughts on the Purpose and Presentation of Consolidated Accounts with Particular Reference to the Auditor', *The Chartered Accountant in Australia*, July 1957.
- Walker, R. G., 'An Evaluation of the Information Provided by Consolidated Statements', *Abacus*, December 1976.
- , *Consolidated Statements*, Arno Press, 1978.
- Watts, R. L., and J. L. Zimmerman, *Positive Accounting Theory*, Prentice-Hall, 1986.
- Whittred, G., 'The Evolution of Consolidated Financial Reporting in Australia', *Abacus*, September 1986.

JOHN HILLIER AND MICHAEL MCCRAE

The Earnings Smoothing Potential of Systematic Depreciation

Ample evidence exists that managers attempt to use 'artificial' choices concerning alternative accounting procedures for classification, valuation and allocation of transactions to smooth reported periodic income or earnings series. However, the actual smoothing effect of such choices and their influence on the properties of earnings numbers is unknown. This study analyses the smoothing potential of depreciation when systematically applied. It exploits an idea regarding the effects of inclusion of expectations information in earnings calculations due to Willett (1988, 1991b), theoretically elaborated by Gibbins and Willett (1997) and applied analytically by Lane and Willett (1997). Using a statistical activity cost theory (SACT) framework, we quantify the smoothing (variance reduction) potential of straight-line and reducing-balance depreciation methods and compare the potential with an analytically derived depreciation method which optimizes variance reduction. We also evaluate the effects of conditioning factors such as accuracy of managers' expectations and relative asset acquisition and disposal values upon smoothing potential. We find that systematically depreciating assets can smooth undepreciated earnings numbers. Straight-line depreciation can exploit virtually all of this potential and reducing-balance depreciation a substantial proportion. However, realising this potential varies greatly depending on conditioning factors. The investigation is practical and policy oriented but complementary to theoretical extensions of the sort suggested by Butler *et al.* (1994). While the article focuses on depreciation, the SACT framework is completely general and may be extended to any choice of method for smoothing earnings series.

Key words: Depreciation; Earnings; Statistics.

There is ample evidence that managers use a variety of instruments to smooth reported periodic income streams because they see advantages in doing so (Cope-land, 1968). It has even been advocated as an appropriate management objective. (Gordon, 1964; Beidleman, 1973). The earlier literature on income smoothing concentrated on the nature, purposes, methods of smoothing and empirical studies of its occurrence. In this literature, smoothing was seen as inherently undesirable. This view is based on the premise that earnings numbers are, or should be, representations of change in some form of economic value (Hepworth, 1953). Smoothing, it is argued, 'biases' earnings as a representation of such a notion of income for a particular

JOHN HILLIER is a lecturer in the Faculty of Commerce, University of Southern Queensland, and MICHAEL MCCRAE is Associate Professor, Department of Accounting and Finance, University of Wollongong.

period and thus detracts from a 'true and fair' view of the results of the period's operations (Chambers, 1966a). Similarly, it supposedly reduces the usefulness of such reported results by distorting the representation of economic performance.

An alternative viewpoint is to regard earnings as a statistic which may be used to infer facts about the economic process in which the firm is engaged (Willett, 1991b; Butler *et al.*, 1994; Gibbins and Willett, 1997). This is the viewpoint taken in statistical activity cost theory (SACT). From this viewpoint, the counterpart to the 'bias' introduced by smoothing may be, for instance, reduced variance of earnings as an estimator of long-run average earnings of the firm, thus increasing its efficiency in a statistical sense (Watts and Zimmerman, 1986). Little is known about the effectiveness of smoothing from a statistical viewpoint despite the existence of an extensive literature on smoothing, depreciation in particular (for a summary see Ronen and Sadan, 1981).

The SACT framework is employed to evaluate the smoothing potential of systematically applied depreciation. Our concern is solely with the measurement question of how much and under what circumstances earnings can be smoothed through depreciation and the significance of alternative depreciation methods in this regard. Findings in this area nevertheless have some bearing on the issues of managerial choice and standard setting with regard to depreciation.

This study is based in a general theoretical sense on the interpretation of depreciation set out in Gibbins and Willett (1997). Gibbins and Willett interpret depreciation as a statistical adjustment which averages 'activity costs' with respect to time rather than an attempt to measure the decrease in some form of economic value of a physical asset due to its use in production or changes in wider economic circumstances. This statistical interpretation is made operational via mathematical analysis in Lane and Willett (1997).

Lane and Willett provide a benchmark for evaluation of the potential of depreciation for effective smoothing and this serves as a basis for this article in a specific modelling sense. Lane and Willett specify a general condition under which application of depreciation reduces the variance of the resulting depreciated earnings series below that of its undepreciated counterpart. Furthermore, in the context of a model incorporating certain assumptions about the distributions of acquisition and disposal values and useful lives, they derive the form of straight-line depreciation which induces minimum variance in the earnings series.

This study therefore draws upon the general, statistical concept established by Gibbins and Willett and its analytic application by Lane and Willett in order to model the actual variance reduction in earnings that can be induced by systematic application of depreciation. We consider three depreciation methods. Further, we consider the influence of the accuracy of managers' expectations about the disposal value and service lives of depreciable assets and also that of relative actual acquisition and disposal values.

Substantial difficulties are involved in any analytic approach to these questions due to the compound probability process implied by the SACT earnings formulation. We therefore adopt the method of simulation experimentation as an alternative to mathematical analysis. A simulation model is constructed to represent the

SACT formulation of the earnings function. This technique is used to investigate the smoothing achievable under two widely applied depreciation methods: standard straight-line and reducing-balance. These results are then compared with those of the minimum variance straight-line method derived by Lane and Willett (1997) for the pattern of asset acquisition and useful life modelled here.

Although the article focuses on depreciation of physical assets as an example of smoothing earnings through accounting choice, it has wide implications. The SACT approach can be applied to most classes of accounting choices for a wide range of earnings smoothing situations.

LITERATURE REVIEW

In the traditional literature, the smoothing of earnings is regarded as a form of managerial manipulation or 'earnings management strategy' (Schipper, 1989) driven by self-interest (Gordon, 1964; Kamin and Ronen, 1978). For example, there is evidence that managers use a variety of vehicles to smooth reported earnings streams because they see advantages in so doing (Copeland, 1968). This is said to be implicitly undesirable since it will typically 'bias' a reported earnings number and distort perceptions of the firm's economic performance and prospects. However, it has been advocated as an appropriate management objective (Gordon, 1964; Beidleman, 1973).

The earlier literature on smoothing concentrated on the nature, purposes, methods and operational tests of smoothing reported earnings figures (Copeland, 1968; Barefield and Comiskey, 1972). Ronen and Sadan (1976) provides a summary. Subsequent analysis of 'artificial' smoothing vehicles in the context of positive accounting theory and agency theory focused on smoothing as an explanation for discretionary accounting choice and a dissection of the benefits flowing to managers from smoothing (see Barnea *et al.*, 1976; Holthausen, 1990; Beattie *et al.*, 1994). Analysis within the context of capital markets also focused on the managerial benefits of smoothing in terms of maintaining the value of the firm through lowering perceived risk, maintaining dividend flows and providing increased certainty as to expected future cash flows (Lev and Kunitzky, 1974; Moses, 1987; Craig and Walsh, 1989; Trueman and Titman, 1988). More recently, the dynamics of the smoothing process itself have received attention especially within the literature investigating the time series properties of income numbers and financial ratios. Studies in this vein include Gonedes (1972), Brown and Rozeff (1979), Hughes and Scheiner (1980), Lambert (1984), Dye (1988) and Lee and Wu (1994). Whittington and Tippet (1995) find empirical evidence of mean reversion in the financial ratios of British corporations, providing support for the smoothing hypothesis alluded to by Lee and Wu (1994).

Smoothing vehicles typically divide into real and artificial dimensions. 'Real' smoothing activities include decisions about the occurrence and timing of transactions. The 'artificial' dimension includes discretionary choices of a wide range of accounting practices and rules concerning classification, valuation and allocation of transactions (Barnea *et al.*, 1976). Depreciation was early identified as a potential

'artificial' vehicle for smoothing by Hepworth (1953), who includes it as one of eight classes of potential smoothing vehicles. Smoothing of earnings through depreciation could be achieved in several ways: (a) increasing depreciation charges during periods of rapid changes in business activity or rising price levels; (b) using asset revaluations (or write downs) to current value as a basis for depreciation charges, rather than historic cost; and (c) the use of different methods of calculating depreciation including, for instance, accelerated depreciation, especially in conjunction with large acquisitions of assets, and units of production methods.

Numerous empirical studies have examined whether or not firms attempt to smooth earnings through accounting choice. A number of these studies investigated the occurrence of smoothing using various smoothing instruments within various industries, corporate structures and production environments (Gordon, 1964; Gordon *et al.*, 1966; Arhicbald, 1967; Copeland, 1968; Copeland and Licastró, 1968; White, 1970; Cushing, 1969; Dasher and Malcolm, 1970; Barefield and Comiskey, 1972; Beidleman, 1973). Belkaoui and Picur (1984) provides a good summary of earlier work on smoothing. Although few of these studies have concentrated explicitly on depreciation, several studies implicitly incorporate it within the general definition of accounting measurements investigated as smoothing vehicles. Typically, these studies examine whether particular accounting choices were actually used to smooth time series of reported periodic earnings numbers. They reveal little about the actual potential of these discretionary choices to achieve smoothing, or about the effectiveness of the readily available alternative methods to exploit that potential (Brayshaw and Eldin, 1989, summarize the findings of a number of studies).

The omission of these measurement issues is not surprising, since most of the earlier smoothing literature is dominated by the traditional approach to accounting measurement. In this approach, measurement issues are not separated from questions of disclosure and use of accounting information.¹ Furthermore, the widely emphasized 'decision usefulness' criterion stresses the relation of accounting numbers to outcomes of perceived importance to decision makers (Butterworth *et al.*, 1982). Coupled with this is a general presumption that users require relevant economic values for input to decision models and to support accountability (Edwards and Bell, 1961; Chambers, 1966b). The result is the view that accounting numbers do or should directly represent economic values in either an historic or current market (buying or selling) price sense.

In consequence, earnings calculations are evaluated according to the faithful representation of the relevant economic value notion (FASB, 1980, 1984, 1985). This corresponds to the view that earnings should reflect differences in the relevant asset values over time, usually due to use in production or possibly changes in technological or market circumstances. In the historic-cost context depreciation methods are therefore typically ranked according to their capability to measure the proportion of service potential used up in a period, allowing time series allocation of the asset's cost.

¹ There are exceptions. For instance, the Hughes and Scheiner (1980) investigation of the efficiency properties for cost allocation methods.

The traditional view of earnings arguably found its most comprehensive expression in the work of Thomas (1969, 1974), especially in relation to problems concerning the interpretation and meaningfulness of allocations such as depreciation. Thomas apparently accepted that the earnings calculation is an attempt to directly measure changes in the relevant form of economic value. However, his examination of the attempts to allocate costs on the basis of the relation of inputs to production with revenue led to dismissal of the possibility that any such attempted matching operations had any empirical basis. Thomas thus concluded that allocations such as depreciation were arbitrary in terms of (direct) economic meaning.

An alternative viewpoint on accounting measurement is surveyed and applied to earnings calculations and allocations such as the depreciation adjustment by Gibbins and Willett (1997). Gibbins and Willett challenge the assumption and conclusion of Thomas, arguing that depreciation is not a direct measurement at all. Rather, it is an indirect or *derived* measurement, giving a statistical representation to the underlying events of acquisition and disposal values and useful lives. They argue that depreciation is a useful adjustment to the extent that it imparts appropriate statistical properties to earnings which can provide information relative to selected parameters of a firm's economic circumstances.

A parameter of interest *might* be long-run profitability. A depreciation method which resulted in a statistically superior estimator of that parameter could be identified, given an appropriate loss function criterion. For instance, earnings calculations of the type considered in this article are unbiased with respect to the above parameter if the 'long run' is taken, for simplicity, to be the lifetime of the firm. The standard statistical criterion of mean squared error, via comparison of variances, could be used to select the most *efficient* estimator (Gibbins and Willett, 1997).

Depreciation policy under this interpretation is likely to play an important role in determining whether the properties of earnings calculations accurately represent firm performance. If, for instance, systematically applied depreciation can, under specified circumstances, be used to smooth earnings in the sense of reducing its variance then it is, in principle, open to management to choose the extent of application of depreciation and the particular depreciation method so as to best achieve this aim. Interpreted as a statistical smoothing device then, the effects of depreciation can be ascertained and the choice of method is certainly not arbitrary.

In fact, SACT constitutes an entire theoretical framework for accounting measurement. SACT has a number of key characteristics which radically differentiate it from the traditional views of accounting measurement and have important implications for our study of the effectiveness of systematic depreciation in smoothing earnings. Most fundamentally, measurement is treated as being logically separate from disclosure and use. Under this view, the effectiveness of a depreciation policy in smoothing earnings is an entirely distinct question from that of the circumstances in which management might be expected to, or should, implement such a policy. Similarly, properties of accounting calculations such as the statistical ones referred to above may be examined independently of the question of perceived usefulness of such calculations in decision making or accountability. For instance, the statistical efficiency of depreciation policies in smoothing earnings can be

considered irrespective of any differences in usefulness of the earnings numbers thereby disclosed.

Gibbins and Willett (1997) link the separate consideration of accounting measurement to the criterion of 'representational faithfulness'. The form which this criterion assumes is one of the relation of derived accounting measurements such as earnings to underlying events *per se*. The underlying events such as the transaction involved in purchasing, say, a depreciable asset and its subsequent physical and legal status *vis-à-vis* the entity (useful life) are regarded as random processes and subject to direct or *fundamental* measurement. Accounting calculations such as earnings are regarded as derived measurements possessing statistical properties such as variance which reflect the underlying economic events from whose fundamental measurements they are constructed. Such calculations may be related to underlying parameters of the events by being regarded as estimators of such parameters, known only to some degree of error.

The separate examination of measurement in SACT means that accounting calculations are not regarded as directly representing economic values. Earnings numbers, for instance, might be used to infer something about changes in a form of economic value but do not provide direct measurement of such a notion of firm performance. As a corollary, the question of whether smoothing through depreciation induces bias with respect to a presumed direct representation of firm performance is no longer relevant.

The smoothing potential of depreciation and the ability of alternative depreciation methods to realize this potential remains relatively unexplored in the literature. This gap exists despite suggestions that income smoothing by managers is appropriate under a rational expectations model (Lambert, 1984) and that income normalization is an important measurement issue (Lev, 1969; White, 1970). For example, little attention has been paid to the potential for use of depreciation policy to make earnings numbers better estimators of long-run profitability.

Several issues remain unresolved. Until the statistical interpretation of depreciation, comprehensively set out in Gibbins and Willett (1997) and its mathematical application in the analysis of Lane and Willett (1997), there was no formal derivation specifying the conditions under which depreciation would reduce the variance of the undepreciated earnings series. Similarly, there was no optimized depreciation method to act as a benchmark for judging the effectiveness of alternatives. Consequently, the practical or quantitative potential of depreciation for smoothing earnings and the significance of alternative depreciation methods in exploiting this potential remains largely unexplored, as does the effect of conditioning factors.

SCOPE OF INVESTIGATION

This article represents an application of the statistical interpretation of derived accounting numbers, in particular earnings and the depreciation adjustment as set out by Gibbins and Willett (1997). The application is to the attempted smoothing of earnings. The present study examines the general smoothing potential of systematic

depreciation and the significance in this regard of alternative depreciation methods from which managers can choose. Smoothing is the assumed goal. The aim is to achieve the maximum variance reduction, which we term 'smoothing effectiveness'. The criterion for effective smoothing thus takes the form of a quadratic loss function.² It also implies that long-run profitability is the parameter of interest. The criterion and parameter are arbitrary, but are sanctioned by wide use of the first and plausibility of the second.

A quantitative investigation of the variance reduction possible under alternative depreciation methods relative to each other and relative to an optimal method is carried out. The benchmark for measuring variance reduction is the variance of the undepreciated earnings number. In studying the outcome of an accounting policy choice, we are clearly studying 'artificial' smoothing. Furthermore, the study is restricted to the efficacy of systematic depreciation in effectively smoothing the earnings series. Systematic depreciation implies the consistent application of the nominated depreciation method. The case of *ad hoc* depreciation alternatives and their performance relative to systematic methods will be investigated in a subsequent paper.

Two types of conditioning factors may substantially influence the realization of smoothing potential. The first concerns the ability of managers to predict the disposal value and useful life of physical assets. Following Willett (1991b) we quantify the smoothing potential of depreciation methods under three states of knowledge for a manager—random expectations, rational expectations and perfect expectations. These three states are fully defined later.

A second set of conditioning factors are the firm's operating circumstances. To limit the study to a reasonable length we consider only variations in mean acquisition and disposal values. All other factors are held constant. This includes such factors as the average levels for start time processes and the distribution of useful lives, the distributional forms of acquisition and disposal values and their variances. Our attention is confined to that component of earnings arising from holding a class of depreciable physical assets. Other components of earnings may be assumed constant, the results holding accordingly.

Using the formal conditions for maximum variance reduction established in Lane and Willett (1997), the present analysis establishes the quantitative variance reduction possible under an optimal straight-line depreciation method (OSLD) which sets a lower bound on the variance reduction in the context of the adopted distributions of acquisition times and useful lives. Against this bound, we establish, in quantitative terms, the variance reduction achieved under standard straight-line depreciation (SSLD) and reducing-balance depreciation (RBD). The two depreciation methods represent alternatives commonly used by managers because of their tax accounting acceptability and conformity with accounting standards provisions. Throughout,

² The probability process is stationary, as explained subsequently in the text. The expected value of undepreciated earnings and depreciated earnings are then equal. Furthermore, the distributions of both earnings numbers are near-normal under the model specifications employed (see Discussion of Results). Use of a quadratic loss function is in some accord with intuition in the circumstances in that the variance of the earnings statistics fully describes their comparative properties.

the results are conditioned by the accuracy of managers' expectations and the ratio between mean acquisition and disposal values.

THEORETICAL FRAMEWORK

The SACT approach

SACT is the general framework adopted for this analysis. SACT was introduced by Willett (1987, 1988, 1991a). Its origins are in the transactions theory of Littleton (1953), the axiomatic approaches of Mattessich (1964), Ijiri (1965, 1975) and Tippett (1978) and the statistical interpretation given to accounting numbers by Brief and Owen (1970). The interpretation of depreciation as a statistical adjustment averaging 'costs' with respect to time (Gibbins and Willett, 1997) is the specific theoretical basis.

In Willett (1991b), SACT was made operational in a context relevant to the content of this article. It was demonstrated that, under certain circumstances, inclusion of systematic depreciation adjustments could reduce the variance of the earnings series. Lane and Willett (1997) have derived a form of the straight-line depreciation adjustment of earnings which is optimal in a variance-minimizing sense under specified distributions of acquisition and disposal values and useful lives. In a review, Butler *et al.* (1994) have suggested casting the question within the theoretical framework of a minimum lower bound of variance to facilitate investigation of the efficiency of earnings as an estimator of longer term cash flow in the SACT environment. Our aim, however, is to extend SACT in a more immediately practical and policy-oriented direction.

In SACT the firm is envisaged as a set of *activities* operated over time. Activities are sets of resources held or transformed in production and thus 'matched' together by cause and effect over time. In the current context, the holding of a depreciable physical asset continuously over a number of consecutive accounting periods is the type of activity of interest. Associated with these activities are certain directly measured quantities: acquisition and disposal values, acquisition dates and useful lives. Such quantities are regarded as random variables. A *class* of activities is defined by having each category of random variable drawn from common probability distributions with specified parameter levels. For example, acquisition dates may follow a Poisson process with its parameter set at mean acquisitions of ten per period, useful lives may be exponentially distributed with a mean of five periods, and acquisition and disposal values may be modelled as being normally distributed with means of ten and one respectively and variances of one and one respectively.

Earnings, an indirect measurement, is regarded as a statistic representing the underlying stochastic process of operating a firm. The above random variables are direct measurements of realizations of the process. Depreciation is regarded as a time-averaging procedure which influences the properties of the earnings statistic. The influence operates through the setting of the depreciation method and the guesses of disposal values and useful lives and thus the question arises as to whether these discretionary or 'control' variables may be adjusted to obtain desirable statistical properties for the earnings numbers.

SACT Formulation of Depreciated Earnings

Earnings is specified via a functional form or algorithm summing over the assets the contribution which each asset makes to earnings during the accounting period. In the majority of instances, this contribution will be the depreciation adjustment if the activity is held at the accounting date or the acquisition value less disposal value less accumulated depreciation, if the asset has been disposed of in the accounting period.

Lane and Willett (1997) define depreciated earnings of the k th activity class as:

$$Y_k(t) = \sum_{i=1}^{i=\delta_k} \alpha_k(i) \{M_k(i, t) - M_k(i, t-1)\} + \sum_{j=M_k(t-1)}^{j=M_k(t)} C_k(j) \quad (1)$$

- where $Y_k(t)$ = the accounting earnings in period t ,
 $\alpha_k(i)$ = the formula reflecting the method for calculating depreciation up to t on basis of elapsed time, i ,
 δ_k = the anticipated useful life,
 $M_k(i, t)$ = the random number of assets acquired i periods before t and still held at t ,
 $C_k(j)$ = the random acquisition less disposal value of the j th disposed of asset at t , and
 $M_k(t)$ = the random number of assets disposed of up to t .

Undepreciated earnings is just the term to the right of the addition sign in (1).

This accounting earnings function is used to model depreciated and undepreciated earnings numbers for each period over a 'decision horizon' of successive accounting periods. The earnings function was converted to a computer program allowing simulation experiments over various depreciation functions and distributions of random variables. Realizations were sampled from the specified distributions for each variable through the decision horizon, indicating that the firm is in a stationary state. A summary of the distributional characteristics of the variables is given in Table 1.

Expectational accuracy with respect to managers' guesses about asset lives and disposal values was varied as follows:

1. Random expectations imply that the manager's guess is modelled by sampling from the same underlying distribution used to sample the realized values.
2. Rational expectations imply that the manager's guesses are set equal to the expected values for the relevant variable.
3. Perfect expectations imply that the manager's guesses are set equal to the realized values of the relevant variables.

Simulations of asset cost contributions to earnings for each period were accumulated separately on an undepreciated basis and on three depreciated bases over the three expectation states. The simulation structure in which earnings numbers were generated and collected covered a ten-period horizon. Asset lifetimes were not constrained by the horizon in that an asset could be acquired before the beginning

TABLE 1
DISTRIBUTIONS OF VARIABLES

Variable	Distribution	Parameter level
Start times	Poisson process	100 activities over horizon
Durations	Exponential	Expected duration = 5 periods
Acquisition values	Normal distribution with three mean, variance combinations ^a	
	Mean Variance	
	3 1	
	6 1	
	10 1	
Disposal values	Normal distribution with mean = 1, variance = 1	

^a Variances are restricted to low values relative to the means to ensure that asset values are not negative.

of the horizon and continue to be held beyond the end of the horizon. A sample size of 10,000 (due to 1,000 repetitions each generating ten earnings numbers) was used in each experiment.

This simulation technique is used to investigate the smoothing achievable under two widely applied depreciation methods referred to earlier, SSLD and RBD. We then compared these results with those provided by the minimum-variance straight-line method of Lane and Willett (1997), the OSLD method. The OSLD method generates the greatest reduction in variance achievable by inclusion of a straight-line depreciation provision in earnings, given that the acquisition times follow a Poisson process and the useful lives are exponentially distributed and that depreciation is applied systematically, that is, strictly according to the nominated method. The derivation of the OSLD method is outlined in Appendix A.

A sample variance ratio (SVR) is calculated as a measure of absolute smoothing effectiveness. The SVR is the ratio of the variances for depreciated earnings (numerator) and undepreciated earnings (denominator). The benchmark is therefore undepreciated earnings, so that the SVR also provides an estimate of the relative smoothing effectiveness of the different depreciation methods under various conditioning factors.

DISCUSSION OF RESULTS

This article examines smoothing potential generally, the smoothing potential of alternative depreciation methods relative to the smoothing limit possible under the OSLD method, and the effect of the conditioning factors. Results are presented in Table 2.

The presentation of results is organized according to three dimensions. The first dimension concerns the use of a depreciation method by managers, that is, whether

TABLE 2

VARIANCE REDUCTION OF DEPRECIATION METHODS FOR
ALTERNATIVE ACQUISITION/DISPOSAL VALUES
ACROSS EXPECTATIONS

(N = 10,000)

	OSLD var.	SSLD var.	RBD var.
Acquisition Values: (mean = 3, var. = 1); Disposal values (mean = 1, var. = 1)			
Random	0.68	0.73	0.74
Rational	0.51	0.51	0.58
Perfect	0.41	0.38	0.44
Acquisition Values: (mean = 6, var. = 1); Disposal values (mean = 1, var. = 1)			
Random	0.56	0.60	0.58
Rational	0.43	0.43	0.40
Perfect	0.41	0.38	0.39
Acquisition Values: (mean = 10, var. = 1); Disposal values: (mean = 1, var. = 1)			
Random	0.53	0.58	0.55
Rational	0.42	0.41	0.37
Perfect	0.41	0.38	0.41

or not to depreciate assets. The second dimension is the choice of depreciation method. The third dimension is the influence of the conditioning factors of the accuracy of managers' expectations and the ratio of mean acquisition and disposal values of the assets.

The F distribution is used to construct confidence intervals for the population variance ratios to give some indication of the precision of the SVRs. The F distribution arises as the ratio of two independent chi-square variates each divided by its degrees of freedom and drawn from underlying normal distributions (Walpole and Myers, 1978). The common example is that of the ratio of sample variances obeying these conditions. In principle, then, confidence intervals may be constructed, in our case for that of the population variance ratios of depreciated to undepreciated earnings. The method and indicative values are presented in Appendix B. Because large sample sizes (10,000) are generated, .99 confidence intervals for the SVRs are quite small, of the order of $\pm .01$ about the SVRs as indicated in Table 2.

However, the F distribution is only strictly applicable given sample independence and normality of the underlying populations. Some elements of sample dependence are inherent in the sampling procedure. Furthermore, work by one of the authors has indicated that the underlying distributions are relatively close to normality and that similar SVRs arise in modelling circumstances where the underlying distributions may be accepted as normal according to goodness-of-fit tests (Hillier, 1996). Under these circumstances the confidence intervals are only points of reference, as we cannot be sure that they provide good approximations of the true levels of precision.

However, other evidence has indicated these confidence intervals are not grossly inaccurate. The supporting evidence is that of repeated experiments using some of the input settings as displayed in Tables 1 and 2, the maximum SVR exceeding the minimum by less than .04 in these cases. Furthermore as our main concern here is to identify substantive differences from the viewpoint of managerial choice, we adopt a pragmatic stance in that only differences in SVRs of .05 or more are regarded as being of significance in this wider sense.

General Smoothing Effectiveness

First, there is discussion of the influence of depreciation methods at a general level. At this level, all depreciation methods under review smooth effectively in comparison with the undepreciated counterpart. As may be seen by inspection of Table 2, very substantial smoothing may be obtained by systematic application of depreciation.

Comparison of Depreciation Methods for Smoothing

There are little or no practical differences between the variance reduction potential of the three depreciation methods, where the SVRs are compared for the same acquisition/disposal value ratio under similar states of expectational accuracy. Thus the two commonly applied methods reviewed here appear to be essentially equivalent in smoothing effectiveness to the optimal straight-line method. This implies that management choice between the two commonly employed depreciation methods makes little difference in terms of effective smoothing. Management efforts to obtain increased smoothing effectiveness may be more effectively directed elsewhere. This point is expanded below.

Conditioning Factors

Increased accuracy of expectations generally produces either increased smoothing or is ineffective in this regard, this applying to all depreciation methods examined. At low acquisition/disposal value ratios, improved expectational accuracy results in increased smoothing with improving accuracy of expectations. However, under intermediate or high acquisition/disposal value ratios, increased smoothing only occurs in the transition from random to rational expectations. Further improvement in accuracy of expectations has negligible effect in these circumstances.

One interpretation is that increased smoothing effectiveness may come from management making efforts to improve the accuracy of their forecasts of useful lives and disposal values of depreciable physical assets. This is especially the case when disposal values are relatively large in relation to acquisition values. In all circumstances, improving forecasts from those based on irregular or otherwise limited observations to those based on averages of the class of asset in question will lead to more effective smoothing.

Smoothing effectiveness due to systematic depreciation is to some extent dependent on the ratio of acquisition to disposal values. At intermediate or high values of this ratio, the smoothing effectiveness of the depreciation methods considered here is substantially greater than at low values of this ratio. However, this dependency

applies only where expectational accuracy is less than perfect. It implies that, where management can make modestly accurate forecasts of asset useful lives and disposal values, the degree of smoothing potential from systematic depreciation will depend upon the composition of the depreciable assets held.

CONCLUSION AND EXTENSIONS

SSLD and RBD were examined for potential smoothing effectiveness in these simulation experiments. They are examples of uniform and accelerated depreciation methods respectively. Both methods represent the major classes of depreciation methods which are commonly used by managers and are feasible alternatives under GAAP. If applied systematically, both methods are apparently potentially effective in smoothing earnings. However, accuracy of manager's expectations and the ratio of asset acquisition and disposal values substantially influence the actual quantitative significance of smoothing which may be achieved by use of these methods.

On these results the scope for management choice of depreciation method to obtain more effective smoothing is very limited. Of much greater potential, in this regard, is effort directed to improving the forecasting of asset-useful lives and disposal values.

Perhaps the most important extensions which might be made to this line of research are the incorporation of non-stationarity in the cost and production variables and consideration of *ad hoc* or opportunistic smoothing. The former may more accurately reflect the circumstances of actual firms while the latter type of smoothing behaviour may at least partially reflect practice. Research is continuing into these matters.

REFERENCES

- Archibald, T., 'The Return to Straight Line Depreciation: An Analysis of a Change in Accounting Method', *Empirical Research in Accounting: Selected Studies 1967*, *Journal of Accounting Research*, Supplement, 1967.
- Ball, R., and P. Brown, 'An Empirical Evaluation of Accounting Income Numbers', *Journal of Accounting Research*, Autumn 1968.
- Barefield, R., and E. Comiskey, 'The Smoothing Hypothesis: An Alternative Test', *The Accounting Review*, April 1972.
- Barnea, A., J. Ronen and S. Sadan, 'Classificatory Smoothing of Income with Extraordinary Items', *The Accounting Review*, January 1976.
- Beattie, V., S. Brown, D. Ewers, B. John, S. Manson, D. Thomas and M. Turner, 'Extraordinary Items and Income Smoothing: A Positive Accounting Approach', *Journal of Business Finance and Accounting*, September 1994.
- Beidleman, C., 'Income Smoothing: The Role of Management', *The Accounting Review*, October 1973.
- Belkaoui, A., *Accounting Theory*, 3rd ed., Academic Press, 1992.
- Belkaoui, A., and R. Picur, 'The Smoothing of Income Numbers: Some Empirical Evidence on Systematic Differences Between Core and Periphery Industrial Sectors', *Journal of Business Finance and Accounting*, Winter 1984.
- Brayshaw, R., and A. Eldin, 'Smoothing Hypothesis and the Role of Exchange Differences', *Journal of Business Finance and Accounting*, Winter 1989.

- Brief, R., and J. Owen, 'The Estimation Problem in Financial Accounting', *Journal of Accounting Research*, Autumn 1970.
- Brown, L., and N. Rozeff, 'Adaptive Expectations, Time-Series Models and Analyst Forecast Revision', *Journal of Accounting Research*, Autumn 1979.
- Butler, D., H. Rhys and M. Tippet, 'On the Wasting of Assets—a Review Article', *Pacific Accounting Review*, December 1994.
- Butterworth, J. E., M. Gibbins and R. D. King, 'The Structure of Accounting Theory: Some Basic Conceptual and Methodological Issues', in S. Basu and J. A. Milburn (eds), *Research to Support Standard Setting in Financial Accounting: A Canadian Perspective*, Clarkson Gordon Foundation, 1982.
- Chambers, R. J., 'A Matter of Principle', *The Accounting Review*, July 1966a.
- , *Accounting, Evaluation and Economic Behaviour*, Prentice-Hall, 1966b.
- Copeland, R., 'Income Smoothing', *Journal of Accounting Research*, Supplement, *Empirical Research in Accounting: Selected Studies*, 1968.
- Copeland, R., and R. Licastro, 'A Note on Income Smoothing', *The Accounting Review*, July 1968.
- Craig, R., and P. Walsh, 'Adjustments for Extraordinary Items in Smoothing Reported Profits of Listed Australian Companies: Some Empirical Evidence', *Journal of Business Finance and Accounting*, Spring 1989.
- Cushing, B. 'An Empirical Study of Changes in Accounting Policy', *Journal of Accounting Research*, Autumn 1969.
- Dasher, P., and R. Malcom, 'A Note on Income Smoothing in the Chemical Industry', *Journal of Accounting Research*, Autumn 1970.
- Dye, R., 'Earnings Management in an Overlapping Generations Model', *Journal of Accounting Research*, Autumn 1988.
- Edwards, E. O., and P. W. Bell, *The Theory and Measurement of Business Income*, University of California Press, 1961.
- Financial Accounting Standards Board, Statement of Financial Accounting Concepts No. 3, *Elements of Financial Statements of Business Enterprises*, FASB, 1980.
- , Statement of Financial Accounting Concepts No. 5, *Recognition and Measurements in Financial Statements of Business Enterprises*, FASB, December 1984.
- , Statement of Financial Accounting Concepts No. 6, *Elements of Financial Statements*, FASB, December 1985.
- Gibbins, M., and R. J. Willett, 'New Light on Accrual, Aggregation and Allocation, Using an Axiomatic Analysis of Accounting Numbers' Fundamental and Statistical Character', *Abacus*, September 1997.
- Gonedes, N., 'Income Smoothing Behavior under Elected Stochastic Processes', *Journal of Business*, October 1972.
- Gordon, M., 'Postulates, Principles and Research in Accounting', *The Accounting Review*, April 1964.
- Gordon, M., B. Horowitz and E. Myers, 'Accounting Measurements and Normal Growth of the Firm', in R. K. Jaedike, Y. Ijiri and O. Nielsen (eds), *Research and Accounting Measurement*, American Accounting Association, 1966.
- Hepworth, S., 'Smoothing Periodic Income', *The Accounting Review*, January 1953.
- Hillier, J. R., *Distributional Properties of Earnings Numbers*, working paper, University of Otago 1996.
- Holthausen, R., 'Accounting Method Choice: Opportunistic Behavior, Efficient Contracting and Information Perspectives', *Journal of Accounting and Economics*, January 1990.
- Hughes, J., and J. Scheiner, 'Efficiency Properties of Mutually Satisfactory Cost Allocations', *The Accounting Review*, January 1980.
- Ijiri, Y., *The Foundations of Accounting Measurement: A Mathematical, Economic and Behavioral Inquiry*, Prentice-Hall, 1967.
- , *Theory of Accounting Measurement*, Studies in Accounting Research No. 10, American Accounting Association, 1975.

EARNINGS SMOOTHING AND SYSTEMATIC DEPRECIATION

- Kamin, J., and J. Ronen, 'The Smoothing of Income Numbers: Some Empirical Evidence on Systematic Differences Among Manager-Controlled and Owner-Controlled Firms', *Accounting, Organizations and Society*, Vol. 3, No. 2, 1978.
- Lambert, R., 'Income Smoothing as Rational Economic Behavior', *The Accounting Review*, October 1984.
- Lane, J. A., and R. J. Willett, 'Depreciation Need Not Be Arbitrary', *Accounting and Business Research*, 1997.
- Lee, C., and C. Wu, 'Rational Expectations and Financial Ratio Smoothing', *Journal of Accounting, Auditing and Finance*, Spring 1994.
- Lev, B., 'Industry Averages as Targets for Financial Ratios', *Journal of Accounting Research*, Autumn 1969.
- Lev, B., and S. Kunitzky, 'On the Association Between Smoothing Measures and the Risk of Common Stocks', *The Accounting Review*, April 1974.
- Littleton, A., *Structure of Accounting Theory*, American Accounting Association, 1953.
- Mattessich, R., *Accounting and Analytical Methods*, R. D. Irwin, 1964.
- Moses, O., 'Income Smoothing and Incentives: Empirical Tests Using Accounting Changes', *The Accounting Review*, April 1987.
- Ronen, J., and S. Sadan, *Smoothing Income Numbers*, Addison-Wesley, 1981.
- Sachs, L., *Applied Statistics*, Springer-Verlag, 1982.
- Schipper, K., 'A Commentary on Earnings Management', *Accounting Horizons*, December 1989.
- Thomas, A., *The Allocation Problem in Financial Accounting*, Studies in Accounting Research, No. 3, American Accounting Association, 1969.
- , *The Allocation Problem: Part II*, Studies in Accounting Research, No. 9, American Accounting Association, 1974.
- Tippett, M., 'The Axioms of Accounting Measurement', *Accounting and Business Research*, Autumn 1978.
- Trueman, B., and S. Titman, 'An Explanation for Accounting Income Smoothing', *Journal of Accounting Research*, Supplement, 1988.
- Watts, R., and J. Zimmerman, *Positive Accounting Theory*, Prentice-Hall, 1986.
- Walpole, R., and H. Myers, *Probability and Statistics for Engineers and Scientists*, 2nd edn, Collier, 1978.
- White, C., 'Discretionary Accounting Decisions and Income Normalization', *Journal of Accounting Research*, Autumn 1970.
- Whittington, G., and M. Tippett, 'An Empirical Evaluation of an Induced Theory of Financial Ratios', *Accounting and Business Research*, Summer 1995.
- Willett, R. J., 'An Axiomatic Theory of Accounting Measurement', *Accounting and Business Research*, Spring 1987.
- , 'An Axiomatic Theory of Accounting Measurement: Part II', *Accounting and Business Research*, Winter 1988.
- , 'An Axiomatic Theory of Accounting Measurement Structures', *IMA Journal of Mathematics Applied in Business and Industry*, Vol. 3, 1991a.
- , 'Transactions Theory, Stochastic Processes and Derived Accounting Measurement', *Abacus*, September 1991b.

APPENDIX A

OUTLINE OF DERIVATION OF OPTIMAL VARIANCE REDUCTION

If values are chosen for α_k and δ_k , then for any t , and omitting these variables by abbreviating (1) in an obvious manner as:

$$Y = D + K$$

it can be seen that:

$$EY = ED + EK$$

from which it follows that:

$$\text{Var } Y = \text{Var } D + \text{Var } K + 2 \text{Cov } (DK)$$

where EY = expected value depreciated earnings,
 ED = expected value of depreciation,
 EK = expected value of undepreciated earnings,
 $\text{Var } Y$ = variance of the depreciated earnings,
 $\text{Var } D$ = variance of depreciation, and
 $\text{Var } K$ = variance of undepreciated earnings.

Therefore:

$$\text{Var } Y < \text{Var } K \text{ iff } \text{Cov}(DK) < 0 \text{ and } 2|\text{Cov}(DK)| > \text{Var } D \quad (2)$$

In the context of a particular model of the activity cost set specifying Poisson acquisition times and iid exponential useful lives (where the latter values and numbers of assets held or disposed of are independent), the straight-line depreciation method which minimizes the variance of earnings through inclusion of depreciation can be derived (Lane and Willett, 1997).

Using (2) and given that the depreciation method is completely specified by $D_k(\alpha_k, \delta_k, t)$, minimization of the variance of $Y_k(t)$ depends on choosing α_k and δ_k so as to minimize $\text{Var } D - 2|\text{Cov}(DK)|$. The optimal depreciation formula $\alpha_k^*(\delta_k^*)$, is a function of the expected useful life. For fixed useful life δ_k , the optimal depreciation formula (α_k^*) is given by:

$$\alpha_k^*(\delta_k) = \mu_c \frac{(1 - e^{-\delta\theta})(1 - e^{-\theta})}{2[1 - (\delta + 1)e^{-\delta\theta} + \delta e^{-(\delta+1)\theta}]} \quad (3)$$

where μ_c is the mean of the acquisition less disposal value and θ^{-1} is the mean useful life. α_k and δ_k were jointly optimized numerically for a range of expected useful lives. Lane and Willett give the optimal depreciation rate, $\alpha_k^*(\delta_k^*)/\mu_c$ and optimal span of depreciation, δ_k^* for such a range and these were employed in the simulation experiments.

APPENDIX B

We construct confidence intervals for the population variance ratios, based on the assumptions of sample independence and underlying normal distributions. The lower (L1) and upper (L2) limits of .99 confidence intervals take the form $(S_A^2/S_U^2)F_{0.005}(n-1, n-1)$ and $(S_A^2/S_U^2)F_{0.995}(n-1, n-1)$ where S_A^2/S_U^2 denote the SVRs. As our sample size N is 10,000 we approximate the required F quantile by

$$\ln F = (0.4343)z\sqrt{2((n-1) + (n-1))}/\sqrt{(n-1)(n-1)}$$

EARNINGS SMOOTHING AND SYSTEMATIC DEPRECIATION

where z is the equivalent standard normal quantile (see for example Sachs, 1982, p. 151).

These calculations yield the following:

SVR	L1	L2
0.70	0.685	0.715
0.50	0.489	0.511
0.40	0.391	0.409

RICHARD K. FLEISCHMAN AND THOMAS N. TYSON

The Evolution of Standard Costing in the U.K. and U.S.: From Decision Making to Control

Decision making and control are two fundamental components of industrial management that are aided by accounting information. This article traces the evolution of standard costing in the U.K. and U.S. and describes how it has served these two purposes over time. At the start of the industrial revolution, standard costing, in the form of past actual costs, aided managers in make-or-buy, pricing, outsourcing and other routine and special decisions. In the late nineteenth century, as the mass production of homogeneous products became more common, predetermined, norm-based standard costs were promoted as the means to control operations and reduce waste. The use of predetermined costs was recommended by both academic and professional branches well into the twentieth century. Since the mid-1980s, norm-based standards have come under fire for not providing appropriate strategic signals in an era of global competition, continuous improvement and perpetual cost reduction.

This article compares the nature of standard costing practices in the British Industrial Revolution with those that evolved in the U.S. under scientific management. The enquiry is not limited to double-entry systems and, like Miller and Napier (1993), the domain is broadened to include other forms of cost-keeping practices. We utilize primary and secondary sources to argue that the environment and rationales for standard costs have changed fundamentally over time. It is speculated that in the future standard costing will be used far less for individual accountability or operational control, but will return to its decision-making roots in the form of long-run cost targets that benchmark the success of continuous cost-reduction efforts.

Key words: Accounting; Cost accounting; History; Standard costing.

Decision making and control are long-standing core components of modern managerial practice, both in the U.S. and the U.K. Historically, standard costing has been promoted in varying degrees to support these two activities. The use of predetermined, norm-based standard costs has come under fire recently for not providing appropriate strategic signals in an era of global competition, continuous improvement, and perpetual cost reduction. In response, many companies appear to have abandoned the use of standard costing for control purposes. This is seen as

RICHARD K. FLEISCHMAN is Professor of Accountancy at John Carroll University and THOMAS N. TYSON is Professor of Accounting at St John Fisher College.

the beginning of an evolution back to earlier days when standards were deployed primarily for decision-making purposes. This article compares the nature of standard costing practices in the British Industrial Revolution (BIR) with those that evolved in the U.S. with the advent of scientific management. Like Miller and Napier (1993), we believe that the domain of accounting history should be broadened to include multiple formats; thus, this enquiry is not limited to double-entry systems installed primarily to generate financial statements. Cost accounting history is viewed as incorporating all forms of costing practice. Secondary sources are utilized to complement findings from our own archival investigations and provide evidence to suggest that the environment and rationales for compiling standard costs have changed fundamentally over time.

By way of introduction, it is crucial to delimit two pivotal terms that appear in the title—‘standard costing’ and ‘control’. Standard costing, it is felt, was the premier innovation of the new scientific management techniques developed and refined in the U.S. during the age of Frederick Taylor in the late nineteenth and early twentieth centuries. This new methodology, which featured time-and-motion studies for the articulation of labour standards and called for the calculation of variances for the analysis of results, was primarily the brainchild of the American engineering community (see particularly Wells, 1978, for a discussion of the engineers’ contribution). Traditional histories, now a half-century old, have supported this timetable for the development of cost accounting (Crossman, 1953; Littleton, 1933; Edwards, 1937; Perren, 1944; Yamey, 1949; Garner, 1954; Solomons, 1952). Recently, a number of critical historians have also focused attention on this period, both in the U.S. and the U.K. (Loft, 1986; Miller and O’Leary, 1987; Hopper and Armstrong, 1991). However, revisionist work has investigated origins in earlier chronological epochs—Johnson (1972), Chandler (1977), Hoskin and Macve (1988a, 1994) and Tyson (1990, 1993) at U.S. venues; and Roll (1930), Stone (1973), Edwards (1989), Fleischman and Parker (1990, 1991, 1992, 1997), Edwards and Newell (1991), Walsh and Stewart (1993) and Fleischman *et al.* (1995) for the BIR. One important issue for the revisionists has been a definition of purposeful standard costing. Does a truly functional standard costing system necessitate the use of time-and-motion studies, stopwatch in hand, with a scientific analysis of variances to achieve labour control and conformity? Most would agree that this degree of sophistication did await the age of Taylor, although Hoskin and Macve (1988a, 1994) argued that they found its genesis at the U.S. Springfield Armory in the 1830s and 1840s. For this article it is suggested that BIR entrepreneurs did utilize standards of a more rudimentary type (expectations from past results rather than norm-based) at times well before the advent of scientific management.

Miller and Napier (1993) advanced another issue that requires a word of discussion initially. They challenged the anachronistic tendency of recent costing historiography to deploy modern idiom and convention, thereby ascribing certain techniques to practitioners in accounting’s past. Since Solomons (1952) credited Harrison (1918–19) with coining the term ‘standard costs’, while Garner (1954) found similar language in Eggleston (1906) and in Knoeppel (1908), ‘standard’ or ‘standard costing’ were clearly not descriptives used in cost accounting parlance

during the early industrial period. Notwithstanding, and not suggesting that modern practice in any shape or form constitutes best practice (e.g., Johnson and Kaplan, 1987), we do argue that present idiom and convention, linking the past to the present, have the positive virtue of enhancing the contemporary reader's understanding of and involvement in the historical narrative. Consequently, the term 'standard' is used rather unabashedly here to describe the process by which BIR entrepreneurs used historical data to generate expectations for decision-making purposes.

In a managerial setting, the word 'control' connotes a variety of activities. BIR entrepreneurs were vitally concerned with the control of costs, waste, raw materials, inventory, resources, etc. However, the control of labour and managers requires a higher level of sophistication (see e.g., Fleischman *et al.*, 1995). For this article, the transition from decision making to control is equated to reference specifically the control and discipline of a firm's employees, workers and managers, rather than the gamut of productive factors which owners, in the pursuit of profitability, sought to harness.

EARLY INDUSTRIAL COSTING: THE U.K.

In recent years there has been a growing interest in the BIR as a possible venue for the 'costing renaissance' that gave rise to cost accounting as a tool for modern managerialism. However, the historical literature on the epoch has achieved little consensus on whether significant methodological development was indeed a feature of the period. The traditional costing histories cited above failed to accord the age any credit in this regard. Indeed, Johnson and Kaplan (1987) and Solomons (1952) have argued that the British should have been pioneers in the evolution of managerial accounting practices in view of their level of economic activity, but that this leadership role never materialized. Lister (1983), an outspoken critic of the value of accounting history as a research area, focused particularly on the BIR in his indictment. Despite the period's legitimate reputation as a golden age of economics, he argued that the primitive state of accounting militated against its meaningful employment for the planning and control of large-scale operations. Perhaps most pivotal to the dismissal of BIR costing was the oft-quoted observation of Pollard (1965, p. 248) that 'the practice of using accounts as direct aids to management was not one of the achievements of the British Industrial Revolution'. Pollard's negative assessment was most compelling because of his extensive knowledge of the period's business records and other archival materials. Despite the intervention of early revisionist writings (Roll, 1930; McKendrick, 1970; Stone, 1973), the verdict has been seconded in subsequent histories (Parker, 1969, 1986; Chatfield, 1977; Hudson, 1977).

Notwithstanding this lengthy legacy, the rehabilitation of BIR costing has proceeded apace. Despite further extensive archival research (Edwards, 1989; Fleischman and Parker, 1990, 1991, 1992, 1997; Edwards and Newell, 1991; Fleischman and Tyson, 1993; Walsh and Stewart, 1993), the issue remains unresolved. Fleischman and Parker (1991, 1997) have pondered how it could be that BIR entrepreneurs

failed to appreciate the value of cost accounting to their enterprises, given their acknowledged sophistication in diverse areas, such as capital accumulation, technological innovation and market development. They went on to document their belief that BIR entrepreneurs did devise 'home-grown' accounting methods beneficial to their individual business ventures. They also attempted to explain why BIR costing has received such scant attention from accounting historians. Factors contributing to this neglect, at least through the advent of World War I (Loft, 1986), might include the absence of a cost accounting literature, a cost accounting curriculum (Stacey, 1954) and an organized profession with developed conventions and practices (Brief, 1965; Yamey, 1960). Furthermore, historians have been mistaken in their assumptions that BIR profit margins were so wide that owners were disinterested in costing; that enterprises lacked complexity in the number of integrated processes they contained; and that accounting innovations were kept highly secret for purposes of competitive advantage. To be sure, two BIR enterprises have been closely investigated—Wedgwood (McKendrick, 1960, 1964, 1970; Pollard, 1965, 1990; Hopwood, 1987; Miller and Napier 1993) and Boulton & Watt (Roll, 1930; Pollard, 1965, 1990; Wells, 1978; Tann, 1981; Fleischman *et al.*, 1995). However, Wells (1978, p. 61) makes the telling point that Boulton & Watt, at least, as 'jobbing contractors' might have been exceptional in that they were price makers at a time when most enterprises were price takers. The same argument could also be applied to Wedgwood.

Antecedents

Scholars have scrutinized a variety of pre-BIR costing records and have diagnosed antecedents that collectively reveal an awareness of cost accounting. Edwards *et al.* (1990) examined the Keswick copper and silver works, dating from 1598. Marshall (1980) observed at the Haddington textile mills the use of costing data for process evaluation, product line decisions, control of raw materials, and 'rational planning' as early as the late seventeenth century.¹ The famous law book of the Crowleys, a Tyneside iron producer, reflected the use of accounting for production planning and inventory control from the early eighteenth century (Flinn, 1957, 1962). Edwards and Boyns (1992, p. 165) examined data relating to iron-making in the Sheffield region from 1690 on and described a variety of decisions managers could make.

BIR Accounting Methods (Without Standards)

BIR archives have revealed a wealth of purposes for which cost accounting information was utilized in decision-making processes. Some of these purposes did not directly involve the calculation of standards and are discussed here more briefly as not directly germane to this paper (for fuller disclosure, see Fleischman and Parker, 1997).² For example, Carron Company abandoned its anchor, anvil and nail

¹ Walsh and Stewart (1993, p. 795), by contrast, evaluated this accounting as little more than a series of rules to ensure discipline, to discourage individuals from 'transgressions by a series of contracts and punishments'.

² Archival references are provided in the narrative. See the Appendix for the location of the archives so referenced.

product lines, while questioning the profitability of its plating forge, blacksmithing and air furnace processes, all on the basis of cost analyses (GD 58/2/1/1, pp. 171, 270; GD 58/2/3/1, p. 7; GD 58/4/1, p. 54). Darby contemplated the closing of certain installations which generated insufficient profits and were comparatively inefficient (1987, Box 20). Wedgwood either discontinued or de-emphasized crests, figurines and painting (Euphemia, 1973). H.&E. Ashworth pondered the discontinuation of its higher quality twist product lines (D3016/2/1). Carron (GD 58/6/4/1; GD 58/2/4/1), Stella Coal Co. (NCB 1/SC 515, 516) and Mona Mine (item 3552) all made mineral field abandonment decisions on the basis of comparative costings. Frequently, mineral field procurements resulted from lease-or-buy decisions. William Lowes, Carron's accountant, was generating reports to support these decisions as early as the 1770s (GD 58/6/4/1). The archives of Darby (Minute Book, 1789–96) and Dowlais (D/DG, Section B, Box 8) likewise evince decision making for this purpose.

The procurement of new technology, especially steam engines, was a decision of great importance for BIR firms. Carron (GD 58/2/3/1, p. 15), Herculaneum Pottery (Minute Book 1806–22, MD 380/47), Davison & Hawkesley (Chapman, 1967) and Samuel Walker & Co. (John, 1951) all had extensive correspondence with Boulton & Watt regarding steam-engine purchase. Stella Coal received seven tender offers for steam-engine upgrades in the 1840s (NCB 1/SC 478, p. 70). The High Rake Mine near Sheffield took special care in its evaluation of four steam-engine estimates in the late 1830s (Bag C, 519, 587/30).

Another decision of importance made without direct recourse to the use of standards was external subcontracting. The most famous example was the decision of Boulton & Watt to end the subcontracting of certain productive processes, such as cylinder boring to the Wilkinsons, with the construction of its Soho Foundry in 1795. Tann (1981) explained this decision in terms of the firm's desire to reserve for itself subcontractors' profits, as well as to quality and timeliness issues. Stella Coal was the leader amongst BIR firms we have investigated in securing tender offers for externally subcontracted equipment, supplies and processes (NCB 1/SC 478, pp. 11, 70, 80, 87). Frequently, subcontracting arrangements were made for transportation networks. Carron subcontracted road repair (GD 58/2/3/1, p. 23), while Darby decided in the 1790s not to construct a railway from a colliery to Horsehay, instead subcontracting the service (Minute Book, 1789–96). A rather surprising number of BIR firms took the trouble to allocate overhead to cost centres, frequently on the basis of predetermined formulae. Carron Company was a pathfinding firm in this regard. In 1763, £2,000 of 'general charges' was proportionately allocated to seven cost centres. It is not clear how the allotment was devised, although it appears not to have been based on either expenses or revenues (GD 58/2/1/1, p. 63). Carron's General Court in the 1760s demanded costings for all Carron products, mandating that each was to contain an applied overhead component (GD 58/2/1/1, pp. 73–8). It was felt, as per Brummet (1957), that pricing decisions could only be relevant with this inclusion. Unfortunately, the archive does not provide evidence that this directive was ever undertaken. Marshall's Shrewsbury accounts for the 1810s evince an allocation of eight overhead cost items to seven cost centres (MS 200, Book 7, pp. 261–2). What is most striking in this apportionment

is the fact that percentage allocations changed as the amount of overhead increased. It would be convenient to assume that this altered distribution reflected changed departmental usages, but in all probability, as Jones (1985) observed about Cyfarthfa allocations specifically and Wells (1978) about overhead allocations generally, the apportionments were arbitrary, inconsistent, and prone to foster incorrect business decisions.³ In the 1840s, a standardized production report came into common use in the Welsh iron industry. This printed form, providing for overhead allocation, was adopted at Abersychan (D454, 939), Dowlais (D/DG, Section C, Box 1), Vivian (item E18), and Cyfarthfa (Jones, 1985; Edwards, 1989). The report, typically called 'Cost of Materials and Iron Made', was of greater significance for establishing transfer prices, as will be discussed subsequently, but seemingly induced firms to allocate overhead according to predetermined formula.

Mineral field abandonments/procurements, capital expenditures for technology, external subcontracting and overhead allocations are offered as examples of BIR decision making which relied on accounting data. The list could be expanded to include vertical integration decisions, quality and expense control, and the wide range of decisions requiring the use of standards or expectations narrated in the following section.

BIR Accounting Methods (With Standards)

It was more frequently the case that standards, however rudimentary, were utilized in a variety of decisions. The control of waste was very much a concern for BIR entrepreneurs, particularly in the dominant iron and textile industries. Some firms were content merely to track the volume of waste and report that statistic in production reports; for example, Oldknow (item 829), Lanark Twist (UGD 42/31/3), Darby (1987, Box 20), Marshall (MS 200/Box 6) and Strutt (01/Box 6). Cyfarthfa, the Welsh iron giant, maintained comparative waste statistics for different coal varieties at seven sites at Cyfarthfa and four at its Ynnisfach affiliate (A2, Vol. II, #14–15). Benjamin Gott, the Leeds woollens manufacturer, compared the waste component associated with various raw materials (MS 193/117a, p. 59). More sophisticated were those firms that took the pains to develop waste cost standards as a measuring calculus. Flinn (1959, 1962) claimed the Crowleys had waste standards and held operatives accountable. The Gregs calculated a waste standard in an elaborate costing they undertook in 1831 to determine the weekly profit from a production level of 18,000 pounds of twist (C5/1/8). Boulton & Watt took into account the value of 'wasters' in its piece-rate negotiations for which the firm is noted (Box 45/20). However, credit for the greatest attention to waste must go to Henry Ashworth, who in the 1840s not only calculated a 3.15 ounce waste standard for every pound of raw cotton spun (D3016/2/1), but also gathered similar statistics from twelve competing firms (DDAs 2/3).

³ Other early evidence of overhead cost allocation may be found in the notebooks of J. J. Guest, manager of Dowlais (D/DG, Section C, Box 1); a Darby history ('Summary of the Value of the Concerns Belonging to Coalbrookdale Co., 1805–1822'); and the Chorlton Mill, as reported by Stone (1973).

As mentioned above, the production report form that came into prominence in the Welsh iron industry in the 1840s became a source document for the establishment of transfer prices. These cost transfers were a combination of actual and standard costs. For example, the average cost of producing a ton of coal for a period became the value at which that raw material input was transferred to all user departments. However, further along the value chain, actual costs ceased to be the basis. For example, at Vivian in 1849 (E18), the fortnightly production cost of bar iron was £5 2s. 0d., while the transfer price to the sheet iron cost centre was £5 15s. 0d. Even firms with fairly primitive accounting overall, such as Vivian, Finlay (UGD 91/422, 423) and Elsecar Old Colliery (WWMA 1600), were utilizing transfer-price standards. Carron, typically in the forefront of accounting methodology, was using field-specific transfer prices for ironstone to the blast furnaces as early as the 1770s (GD 58/6/4/1; GD 58/2/4/1). Darby established transfer prices as semi-finished goods flowed through integrated processes (items 336–7). Edwards (1989) claimed that the transfer prices in evidence at Cyfarthfa permitted that iron giant to be the first in the U.K. to integrate its cost and financial records. Stone (1973) found transfer pricing at the Chorlton Mill of Birley & Co. Finally, the relative completeness of Boulton & Watt's archive permits researchers to trace the increasing standard costs of components through the accounting system to the point of sale of completed engines (Arch 05/1/251, 272).

BIR enterprises were vitally interested in transport alternatives. Boulton & Watt (Box 42/1) and Mona Mine (item 3553) considered alternatives to shipping through Liverpool. Wedgwood did a cost/benefit study of constructing a Staffordshire canal (Euphemia, 1973), while a competitor, Herculaneum Pottery, evaluated alternate routes to the Sankey Canal (Minute Book 1806–22, MD 380/47). The Clydach iron concern did a more global analysis of the relative advantages of shipping by railway and canal respectively (Maybery 918). Stella Coal solicited estimates from two noted coal viewers,⁴ James Hall and John Buddle, for two different routes for leading coal from the mines to its staiths (transshipment points). This analysis is particularly valuable because it affords the opportunity to trace a business decision from *ex ante* estimates to *ex post* action, the actual construction of a waggonway over the route indicated (NCB 1/SC 471, pp. 186–90; NCB 1/SC 473, pp. 51–3).

Standards were frequently utilized for estimating road and waggonway construction costs. For example, Dowlais estimated a 5¹/₄d. per yard banking cost and 4¹/₄d. per yard for cutting and wheeling for a turnpike in 1795 (D/DC, Section E, Box 8). Middleton Colliery estimated the cost of a new road at a standard rate per yard (MC 233). A proposed waggonway from Plessey Colliery to the River Blyth was costed at 3s. 6d. per yard, but with a 12d. reduction where the routing could parallel a pre-existing waggonway (ZR1/35/15).

Throughout the production process, BIR entrepreneurs developed a series of expectations, occasionally articulated as standards. Textile firms particularly conducted trials with their raw materials to determine the varieties that were most cost

⁴ Viewers were consultant engineers hired to evaluate mining operations. In this capacity they frequently functioned as cost accountants.

efficient. Gott (MS 193/117a) and Pease (D/HP/11) analysed various raw wool mixtures. Ashworth (D3016/2/1) and Greg (C5/8/12) regarded the appropriate raw cotton input a key to profitability in their highly competitive market. John Barraclough, a silk entrepreneur, conducted 'experiments' and calculated 'estimates' with his raw material (SPL 203). Dowlais (D/DG, Section B, Box 8) and Stella (NCB 1/SC 343, pp. 55–6; NCB 1/SC 486, pp. 72–4) had assays performed on their coal and coke varieties to determine which had the greatest productive potential.

Firms with more advanced accounting systems developed standards relative to technology expectations. Philips (D644/1/1), Ashworth (DDAs 2/3) and Marshall (MS 200/Box 6) maintained performance records on their various machines. Philips (D644/7/1), Marshall (MS 200/Box 6) and James Bury, a calico manufacturer (L4/2/4/1), costed individually their various operational processes. Inventory control was practised by a substantial majority of the BIR enterprises investigated. Inventory was typically maintained at standard cost. Control was particularly tight at Ketley, a Darby installation, where daily reports were prepared on raw material inputs and the volume of scrap associated with production (1987, Box 20). Most remarkable was a decimal rating system employed by the Strutts, a Derbyshire cotton manufacturer, to value its finished goods inventory qualitatively (01, Box 4).

It is our contention that BIR entrepreneurs employed historically derived expectations or 'standards' as a tool for decision making in a wide variety of areas. Product costing and pricing were influenced by the articulation of waste standards, transfer pricing and the application of overhead to product. Standards were developed to aid firms in making decisions regarding raw materials, particularly differential mineral field costs and appropriate raw cotton and wool mixtures. Standards were also relevant to transport options, technology expectations and the control of various aspects of operations (e.g., waste, raw materials, processes, inventory). But the question still remains: was accounting deployed to achieve the control of labour and managers, the more limited aspect of control that critical historians seek as the genesis of modern managerialism (Hoskin and Macve, 1988a, 1994; Ezzamel *et al.*, 1990; Walsh and Stewart, 1993; Fleischman *et al.*, 1995)? To answer this question requires an examination of BIR archives for evidence of labour and managerial control.

Labour and Managerial Control

A substantial number of BIR firms generated statistics that tracked labour performance. In discussing their various methods, a hierarchical narrative from least to most sophisticated is adopted. Most simplistic was the accounting of textile enterprises that maintained a daily record of each operative's output, but did not employ these data to articulate efficiency standards; for example, Gregs (C5/1/7/1), Oldknow (item 829), McConnel & Kennedy (Cotton Pickers Account Book), Stansfeld (STA 225/8) and Murgatroyd (JM 174). One might expect that individual productivity would be tracked more carefully in the extractive industry for the simple reason that miners were typically paid on a piece-rate basis. However, pit bills sighted in the Durham region (NCB 12/1; NCB 2/269) provide no insights on the process by which the piece rates were determined or amended. Likewise, there is no evidence that individual

miners were held responsible for maintaining stipulated production levels, other than by the deprivation of piece-rate income.

A slightly higher level of sophistication was reflected by those firms that did punish operatives for subpar performance. Flinn (1962) reported that Crowley levied abatements for defective work or unaccounted raw materials. Carron likewise penalized workers for defective output (GD 58/14/2). Two cotton enterprises maintained separate account books with interesting titles to record labour malfeasance—Strutt ('Quarterly Gift Forfeits', 01/Box 34) and Oldknow ('Disgrace Account'; Unwin, 1924).

Internal subcontracting has been identified in the labour-process literature as an intermediate step in management's ongoing effort to 'deskill' labour (Braverman, 1974; Clawson, 1980; for a neoclassical response, see Fleischman and Tyson, 1996b). Internal subcontracting entailed the establishment of piece rates minimally and, in more advanced stages, the articulation of labour standards.

Many large-scale mining operations featured piece rates known as 'tribute bargains'. In some instances, these rates were shaft-specific and were renegotiated every two months. Good examples of such arrangements exist for Birtley Coal (NCB 2/4), Mona Mine (items 48–52) and Ecton Mine (D3060/4). Raistrick (1970) said of Darby's tribute bargains that they permitted the elevation of superior operatives to positions of managerial responsibility.

There were a few occasions on which BIR firms actually developed labour cost or efficiency standards. Henry Ashworth noted in his 1849 diary a spinning standard for sixty pound twist of 250 pounds weekly or fifteen hanks per spindle (D3016/2/1). At Darby, there was a sixty pounds per week output expectation from puddlers with bonuses given for excess production and abatements levied below (Raistrick, 1970). At Middleton Colliery, differential labour cost standards were articulated for the different shafts comprising the firm's operations (MC 133, 157). Finally, Thomas Beer, Mona's accountant, developed raw-material and labour standards for six processes that comprised smelting, roasting and refining (item 2637). Perhaps illustrative of the greater attention paid to raw material inputs, there were coal cost standards provided for each process, but labour cost standards for only two of the six steps.

Foucauldian historians would and have argued that labour standards reflective of modern management would be those that ordered workers about, creating a panoptic gaze and a functional disciplinarity. Hoskin and Macve (1988a, 1994) have identified such a regime at the Springfield Armory, where labour standards were established by time-and-motion studies, stopwatch in hand. Corresponding efforts during the BIR paled by comparison. Rimmer (1960) claimed that John Marshall's flax enterprise had labour standards resulting from time-and-motion clocking. However, our investigation of the archive leads to the conclusion that the firm had sufficient data to develop efficiency standards for both men and machines, but that technology concern was so paramount that effort was not expended on the calculus necessary to control labour. George Johnson, one of the most famous mining viewers of his age, did clock the time required for 'drawing, striking, and putting into the shaft each iron 60 peck tub' as one minute, fifteen seconds (NRO

ZW1.5, p. 5). Subsequently, he calculated an average day's production standard for hewers at the Thornley and Cragwood Collieries (NRO ZW1.5, pp. 5, 26–7).

Evidence of labour control would be altogether scarce for the BIR period were it not for the well-documented, standard-setting events that transpired at Boulton & Watt (Roll, 1930; Pollard, 1965; Wells, 1978; Tann, 1981; Fleischman *et al.*, 1995). Consequently, while it is unnecessary to rehash the process by which internal sub-contractors bargained piece rates, some conclusions will be drawn. It would appear that the steam-engine manufactory did exercise significant control over the physical standards developed to cost the hundreds of components that comprised finished steam engines. However, the labour standards articulated in 1800–2 appeared to have been a one-off exercise in that the piece rates, if scientifically engineered in the first instance, were only sporadically amended. Consequently, they could not compare qualitatively to standards subsequently found by Hoskin and Macve (1988a, 1994) at the Springfield Armory, even though they were substantially superior to any other labour control activity the BIR had to offer.

In summary, labour control was not a focal point of attention for BIR entrepreneurs. A researcher into Tyneside mining records, for example, cannot help but be struck by the lack of accounting in this seemingly critical area. Stella Coal's archive, for example, contains some extraordinarily detailed differential analyses on construction projects, but virtually ignores labour productivity. In the vicinity of Newcastle, the coal trade was rigidly controlled by an association of mine owners. The number of miners annually bound to the various collieries was carefully tracked (WAT 1/5/31a), but there was no attention at all given to the productivity of individuals, only overall production. The view book of George Johnson (NRO ZW1.5) contains a standardized list of questions viewers typically asked in evaluating mining activity. The productivity of existing technology was carefully scrutinized, not the productivity of labour.⁵

The Tyneside phenomenon (see also McLean, 1997; Oldroyd, 1996) was repeated the length and breadth of the BIR. Accounting systems generated sufficient data for labour control purposes. However, there is no evidence that anything was ever done with the statistics. The same general conclusion applies to managerial responsibility as well. BIR entrepreneurs never tired of generating statistics comparing multiple function rooms or entire mills. For instance, the Strutts (01/Box 3), Lanark Twist (UGD 42/31/2) and the Chorlton Mill (Stone, 1973) had data on their individual spinning and carding rooms. Boulton & Watt had expense reports for four latheing and two drilling rooms (Arch 05/1/386). Likewise, there was a considerable volume of mill comparisons. The archives of Strutt (01/Box 3), Ashworth (MS 1201/R10), Philips (D644/1/1), Lanark (UGD 42/31/2) and Marshall (MS 200/39) reflect this exercise in textiles; while Darby (1987, Box 20), Dowlais (D/DG, Section C, Box 1) and Butterley (D503B, pp. 19, 23) are likewise representative for the

⁵ One reviewer has perceptively enquired whether or not the lack of attention to labour control in Tyneside was related to the 'buddy' system of subcontracting which, in effect, would delegate responsibility to lower managerial levels. However, the buddy system, while popular in the western regions of the U.K. where the 'longwall' system mandated a collective approach to mine exploitation, did not operate in Tyneside where the 'bord and pillar' system functionally made independent contractors of individual hewers (Flinn, 1984).

iron foundries. Once again, this research has unearthed no direct evidence that anything was ever done with these data.

Finally, there exists a handful of actual comparisons made to document the performance of individual managers. Carron (GD 58/6/4/1) rated two ironstone quarrying managers, Mona two smelting supervisors (item 2528) and Boulton & Watt weighed the relative talents of managers in making its internal subcontracting decisions (Box 37/3, 45/19, 45/20).

Based upon this wealth of archival findings, one is left with the conclusion that the entrepreneurs of the BIR did employ a variety of accounting techniques to aid them in various decision-making processes. However, the control of labour and managers awaited a later development in the U.S. during the age of Taylor and scientific management.⁶

THE DEVELOPMENT OF NORM-BASED STANDARDS: THE U.S.

But for a few large capital equipment builders and mass-production manufacturers, the majority of early U.S. industrial businesses were small and entrepreneurial. Most entrepreneurs were hands-on managers who actively participated in all key aspects of their businesses, while many had unique technical skills, a strong work ethic, the ambition to expand trade and, consequently, to improve their standards of living.⁷ Few had formal training in business or accounting or even exposure to other formal aspects (planning, staffing, coordinating, etc.) of what some now call a 'managerial perspective'.

The use of regular and detailed cost keeping in the U.S. first arose in large, fully integrated facilities in the mining, arms-making and textile industries in New England in the early 1800s. Complex manufacturing and assembly processes and the need to devote more energies to marketing and sales forced owner/managers to delegate internal administrative tasks and to utilize cost data for decisions that included outsourcing, routine and special order pricing, piece-work rate setting and internal subcontracting. For example, the factory agent of the Merrimack Manufacturing Company in 1830 described the cost advantages of putting out (subcontracting) work to a competitor mill (Tyson, 1992). The first use of standard costs for control is not a trivial issue in accounting historiography. Fleischman *et al.* (1995, p. 162) argued that the use of accounting numbers for human accountability 'provides the factual foundation that will determine how far each of these positions [the Marxian/labour process and Foucauldian schools] can be rationally sustained'. Boyns and Edwards (1995) also discussed this paradigmatic dispute.

⁶ Our conclusion, based upon a general examination of extant BIR archival materials, is supported by the findings of Boyns and Edwards (1995, p. 41) specific to Dowlais: 'It is worth commenting that our description of the role of the costing information is singularly lacking in any reference to its use to control the performance of individual workers, be they unskilled labourers toiling at the furnaces or the managers of different departments'.

⁷ According to Toms (1993, p. 1): 'Entrepreneurs are individuals who make decisions on the employment of resources and bear the financial risks associated [with] those decisions'. See Tyson (1988) for discussion of the variety of business tasks that were conducted by a nineteenth-century boat builder.

Although cost information was utilized by owner/managers in a variety of decision-making contexts, more modern procedures, such as norm-based standards and systematic depreciation,⁸ are notably absent from surviving records. A number of scholars (Miller and O'Leary, 1987; Hopper and Armstrong, 1991; Tyson, 1993) dated standard costing from those early twentieth-century U.S. enterprises which first utilized scientific management techniques, including predetermined time-study-based norms and the calculation of cost variances. We believe that these procedures were not used before this time because they were either irrelevant, too costly or incongruous with existing social mores. In describing the role of accounting for nineteenth-century U.S. paper-mill owners, for example, McGaw (1985, p. 718) explained why accounting was not needed to control labour: 'Continually falling labor costs and the absence of additional labor-cost calculations testify that mechanization enabled Weston to reduce labor costs without the aid of accounting'. In the U.S. cotton mills of the early 1800s, Tyson (1992) concluded similarly that paternalistic controls which were exercised through the employment of family members could have allowed Samuel Slater to defer development of norm-based standard costs.

The most sophisticated user of accounting controls in the pre-Civil War period was the Springfield Armory (Chandler, 1977). In the early and mid-nineteenth century, the armoury produced interchangeable parts, substituted capital equipment for skilled labour, subdivided work tasks and established cost and price ceilings for competing arms makers in the private sector.⁹ The armoury's accounting system was designed to summarize financial transactions, track the physical flow of goods and establish accountability for material loss or waste. The majority of production workers were paid by the piece, with earnings ranging between \$20 and \$60 a month depending on 'the difference in skill, industry, and ambition of men of the same trade' (American State Papers, 1823, p. 542).

Johnson (1972) described how managers at the Lyman Mills had integrated the cost and financial accounting systems. By the 1850s, they were compiling aggregate product costs for each mill account semi-annually, and by 1875 they had developed the potential to determine cost per unit figures for each style of finished goods. Johnson (1972, p. 474) concluded that Lyman's cost system could 'facilitate control of internal plant operations', but he gave no indication that predetermined cost data were used to monitor worker performance.

Fleischman and Tyson (1996b) recently re-examined the surviving business records of the Waltham Watch Company, the leading nineteenth-century U.S. timepiece manufacturer. While the archive provides many examples of inside contracting and piece-rate accounting, and although the possibility of hierarchical surveillance to

⁸ The majority of BIR firms did attempt to depreciate (usually called wear and tear) their assets. Some efforts were extremely complex as at Horrocks, Crewdson & Co. (DDHs 65). Others factored depreciation most prominently in profitability analyses (e.g., Ashworth [MS 1201/R106303]). However, there is no indication that depreciation was handled in a systematic fashion.

⁹ Private arms makers had to supply firearms to the government at a price based on the cost figures incurred at the armoury. See Deyrup (1970) and Hounshell (1984) for a detailed discussion of business and accounting practices.

render total human accountability cannot be ruled out, no examples of standard costs were found. Another successful and technically advanced antebellum U.S. industrial company was the Baldwin Locomotive Works. Brown (1992) investigated this company thoroughly and while finding evidence of systematic management procedures, he did not report finding instances where labour standards were developed and used for control purposes. The closest examples to standard costs appear to be the past actual cost data used by the Carnegie Steel Company in the late nineteenth century to 'evaluate the performance of department managers, foremen, and men' (Chandler, 1977, p. 268), but these costs were neither predetermined, norm-based nor designed to monitor individual employees. While the absence of positive evidence can never be conclusive about the existence of a particular procedure, and although several recent scholars have contended otherwise, there are presently no clear and certain examples to show that any nineteenth-century firm, in either the U.S. or the U.K., used norm-based standard costs to monitor, discipline or control individual workers before 1900.¹⁰

In summary, large nineteenth-century U.S. and U.K. firms compiled past or present prime costs and certain overhead items into an average cost figure for making bids, costing products, evaluating departments and managers, and preparing forecasts and budgets. Cost rules were developed to price different models (of firearms, locomotives and watches) and grades (of cloth) to facilitate pricing, outsourcing and product termination decisions. Individual employees were given an incentive by piece-rate wage schemes and were evaluated on quality, quantity and due-date criteria, as well as on more personal characteristics of sobriety, work attendance and personal demeanour. However, there is no evidence to suggest that predetermined, norm-based standard costs were used as the measuring calculus for labour discipline and control.

THE DEVELOPMENT OF NORM-BASED STANDARDS

The economic downturn of the 1870s precipitated a general expansion of business with producers of watches, sewing machines, bicycles and other consumer goods paying ongoing attention to cost and quality issues. Some businesses responded to the crisis by merging with competitors, while others automated production, further subdivided labour tasks and generally sought to decrease labour costs. U.S. firms initially adopted more rational and systematic management procedures, including better shop planning and layout and specialization by product, technical operation and production process (Litterer, 1963).¹¹ Articles describing ways to improve first appeared in the mid-1880s in U.S. journals sponsored by engineering societies and

¹⁰ See Ezzamel *et al.* (1990) and Hoskin and Macve (1988a, 1988b, 1994) for their differing interpretation of the nature of standard costing at the Springfield Armory in the early 1840s.

¹¹ The role of the engineering profession and its journal literature in the development of standard costing has been emphasized as the innovation that launched cost accounting into the modern era (Wells, 1978; Fleischman and Tyson, 1996a). See Litterer (1963) and Yates (1989) for detail about systematic management and cost accounting during this period.

were intended to spur owner/managers to adopt new and innovative administrative procedures. The authors were typically industrial engineers who promoted a variety of 'rational' and systematic management procedures in trade publications and academic-type conferences.

Expanding on the work of Metcalfe (1885) and Towne (1885–6), Taylor (1911) discussed the importance of eliminating waste and inefficiency, in regard to both labour and materials, as the keys to greater profitability. He recommended a set of principles that included job analysis, the identification of best practices, differential piece rates, functional foremen and scientifically derived, norm-based standard costs. Together, these procedures were to comprise scientific management which when generally adopted 'would readily in the future double the productivity of the average man engaged in industrial work' (Taylor, 1911, p. 142). Gilbreth (1914, p. 8) similarly left no doubt that these principles would improve labour efficiency when he defined motion study as 'the science of eliminating wastefulness resulting from using unnecessary, ill-directed, and inefficient motions'.

Emerson (1908–9) promoted a new method of ascertaining costs contemporaneously coming into vogue in large plants, wherein costs were determined in advance of manufacturing rather than after. The new approach, it was argued, had the advantage of allowing managers to control more effectively for waste and loss due to inefficiency (Sowell, 1973). However, Solomons (1952) pointed out that these initial standard costing efforts suffered two fundamental shortcomings: (a) an absence of theory regarding standard definition (e.g., ideal or practical), even though Harrison (1918–19) addressed this issue in detail; and (b) an insufficient appreciation for the informational content of different breakdown possibilities for variance analysis. Church (1914) and Harrison (1921) also formulated detailed cost-keeping systems that included standard costing as an integral component. Along with net profit and return on investment, cost variance was promoted as the primary financial measure for evaluating managerial performance. According to Sowell (1973, p. 524), 'the industrial engineer, rather than the cost accountant, recognized the need for a revolution in the industrial order and initiated ideas that developed into predetermined cost techniques'.

Chandler (1977) maintained that large-scale U.S. organizations needed and then initiated more detailed cost accounting procedures in response to market pressures and the complexities of management. In contrast to Chandler's thesis of cost accounting developments paralleling organizational change, Boyns and Edwards (1995, p. 7) noted that in the U.K. 'there is no reason why, *a priori*, one should expect a link between the development of large-scale business and that of management accounting'. In somewhat related fashion, Smallpeice (1949) observed that professionally trained accountants were not commonly full-time employees in industry in the U.K. until the 1920s, and that progress in management accounting was forthcoming only when engineers and accountants worked together.

Conventional (Chandler, 1977; Johnson and Kaplan, 1987) and critical historians (Miller and O'Leary, 1987; Miller and Napier, 1993) alike have suggested that norm-based standard costs were first used in conjunction with scientific management procedures developed by Taylor and his associates. As Miller and O'Leary (1987)

correctly pointed out, the social and political environment of the early 1900s reinforced many of Taylor's propositions. Epstein (1978, p. 127) examined Taylor's work at Midvale Steel in the early 1880s and concluded that 'the logical consequence of the established time standard was the determination of related cost', and that, 'we can identify these concepts as those used in standard costing in the computation of variances'. Epstein also examined Taylor's consulting work at the Eastern Manufacturing Company and determined (p. 142) that 'standard costs had been developed for each operation in the production process' and that cost inspectors investigated 'the reason that the [actual] cost was greater or less than the standard'. Epstein also found that the H. H. Franklin Company appraised work performance by comparing actual to standard costs. On the other hand, the Joseph & Feiss (J&F) Company in Cleveland adopted many of Taylor's concepts and employed a planning department, standard methods and job tasks, and work measurement procedures. J&F did employ sophisticated piece-rate wage schemes that were developed carefully through work sampling and time studies, but it did not develop standard costs or compute variances. Moreover, Taylor worked at the Bethlehem Steel Company from 1898 to 1901, but that firm had no standard costing despite Taylor's presence. Nelson (1979) observed that only forty-six industrial firms are noted in the literature of Taylorism as introducing scientific management between 1901 and 1917 and concluded that cost keeping was only an incidental component of the planning department in pre-1920 scientific management firms. Hallbauer (1978) argued similarly that the accounting systems described by Taylor in his work as a consultant did not incorporate standard costs and variances.

In summary, only a handful of companies before 1920 may have actually implemented systems which utilized labour standards and analysed cost variances. This view is supported by a contemporary study which showed that Taylor's recommendations to control labour and eliminate waste were rarely if ever implemented in pristine form (Hoxie, 1915). Oakes and Miranti (1996) attributed much of scientific management and standard costing's popularity to the promotional efforts of Louis Brandeis, rather than to its proven successes in the field. While the theory of standard costing and its ability to identify the amount of cost (waste) that could be controlled was highly intuitive and widely promoted, resistance from owners, foremen and workers all deterred its implementation. It can be concluded, therefore, that standard costing was warmly embraced in theory but only implemented by a limited number of industrial engineers and innovative plant managers. Notwithstanding, where standard costing was employed it was used for control and not decision-making purposes.

Although standard costing was a distinctly American phenomenon, early British theorists (Garcke and Fells, 1887; Norton, 1889; see also Brummet, 1957; Garner, 1954) had significant insights on the subject. Garcke and Fells suggested the value of establishing norms of cost wherein the person best acquainted with a particular process should estimate a probable cost in terms of wages and materials. Church (1901), though critical of Taylor, did not substantially differ in his discussion of engineered standards and their utilization in predetermining costs and comparing estimates with actual results (Sowell, 1973). Solomons (1952) credited Whitmore

(1908) with detailing a standard cost system based on the ideas of Taylor and Church, although he made original contributions in his own right in handling idle time and material use variations (Parker, 1969; Sowell, 1973).

Costing innovations developed by Emerson, Harrison and others were actively and consistently promoted by professional accounting organizations during the first eighty years of the twentieth century. The Institute of Cost and Works Accountants in the U.K. addressed cost and managerial issues in its journal, *The Cost Accountant* (Loft, 1990). In the U.S. the National Association of Cost Accountants (NACA) noted that the accountant's role in cost control occurred principally through the preparation of standard cost reports:

The control of costs involves the adoption of standards of comparison . . . Control is achieved through efforts to keep actual costs in line with predetermined standards and by comparison of actual costs with these standards to reveal out-of-line performance in order that steps may be taken to remove the causes. (NACA, 1968, pp. 107–8)

Academic institutions and individuals also adopted an unproblematic view about the effectiveness of standard costing for operational control. For example, the Committee on Cost Concepts and Standards (1956, p. 188; see also Goetz, 1949) concluded that, 'cost data therefore are devices by means of which management can direct individuals within the organization to carry out plans'. A representative mid-century U.S. textbook writer adopted a similar view of the procedures that underlie standard costing:

The usefulness of the time and motion technique should be clearly understood. The use of basic motions and the time taken for different operations gives management a more or less objective test that is independent of the previous performance. This objectivity, it should be pointed out, is one of the strongest arguments in favor of the applications of standards. (Devine, 1950, p. 396)

In general, the accounting establishment promoted the use of standard costs for operational control and the benefits of comparing actual to planned results, but lacked specific guidance about how these standards were to be developed or implemented. In fact, standard costs may have been of relatively minor importance in actually achieving operational control, if the comments of the treasurer of the Chemstrand Corporation are at all representative of the views of financial executives:

From some of the current literature on the subject one might suppose that management consists largely, if not entirely, of taking action based on the statements submitted by the accounting department . . . This is absurd. From the vantage point of a good many years' experience in both management and accounting, I observe that while accounting reports facilitate good management they are certainly not its exclusive, or even its most important component. They are of vital, but limited, usefulness. (Greer, 1954, p. 175)¹²

¹² Simon *et al.* (1954, p. 27) reached a similar conclusion in their study on controllership: 'A large part of an operating executive's knowledge about his operation comes by direct observation and informal reports. These reports are frequently verbal and come to him through the regular supervisory channels. Accounting reports are only one, and not always the most important, of his sources of information, although they may be of considerable use in confirming his observations.'

There were always voices, especially from organized labour, which have raised questions about accounting's ability to control labour processes. For example, Hoxie (1915) noted that no firms imposed scientific management procedures on union workers without modification, negotiation and compromise.¹³ During the 1910s and 1920s, U.S. labour leaders recognized the importance of eliminating waste and controlling costs, but they usually blamed management for problems in this area. Thus, William Green (1927, p. 729), President of the American Federation of Labor, wrote: 'Labor realizes that indefensible waste takes place when Labor's industrial efforts go for naught or are unnecessarily duplicated through the failure of management to systematize and intelligently direct the working forces of industry'.

The 1929 Depression and the subsequent years of economic decline prompted the U.S. federal government to stem unemployment and stabilize wages. Section 7a of the National Industrial Recovery Act (NIRA) of 1933 endorsed the collective bargaining process and representation by national unions. The NIRA also authorized the creation of industry codes to establish wages and hours policy. The codes were designed to set wage minimums and hourly maximums, although they were often ineffectual and their authority was frequently challenged by non-union and small, independent producers. Although the NIRA was eventually declared unconstitutional, the National Labor Relations Act of 1935 and subsequent National Labor Relations Board 'case law' decisions legitimated unions and their participation in developing standards and negotiating other pay-related issues. In effect, federal legislation and the commitment by labour and management to an ongoing collective bargaining process meant that standard costs were rendered largely inconsequential as a labour control mechanism after the mid-1930s.

Of course, particular union representatives, general economic conditions and past labour-management relationships all affected the quality of labour's participation in time-study, piece rates and production standards, and the consequent standard cost numbers.¹⁴ Notwithstanding, Chamberlain (1951, p. 36) argued that organized labour had consistently sought a voice in determining 'a fair day's work'. Gomberg (1946, pp. 363-4) described the many judgmental factors that were involved in time-study, job evaluation, incentive piece-rate schemes and other engineering techniques that would be challenged by labour: 'It can easily be seen, therefore, why no experienced union is prepared to leave these techniques to the unilateral judgment of management itself'. If standard costs were used by management to control labour processes, increase effort levels or reduce real wages, these numbers would have been challenged during contract negotiations in a fashion comparable to other wage-related matters. Thus, in our view, the contention that standard costs effectively controlled labour processes in earlier or later time periods is extremely problematic.

¹³ See Tyson (1994, 1996) regarding the development and arbitration of production standards in the 1920s in the U.S. tailored men's clothing industry.

¹⁴ Barbash (1948, p. 73) discussed the varying nature of union involvement with scientific management: 'If and when the traditional union opposition to work rationalization schemes is surmounted, the union's strategy is to subject the details of these schemes to the give-and-take of collective bargaining'.

Beginning in the mid-1960s, academic accountants began questioning the behavioural assumptions that underlie standard costs. For example, Caplan (1966, p. 506) wrote: 'Many management accounting techniques intended to control costs, such as budgeting and standard costing, may virtually defeat themselves because they help to create feelings of confusion, frustration, suspicion, and hostility'. Hopwood (1972) challenged the propriety of budget-constrained cost control as opposed to a more flexible use of budget numbers, while Tinker *et al.* (1982) chronicled accounting's role in maintaining power structures and class distinctions within the firm.¹⁵

In the early 1980s, a chorus of critics, both in and out of accounting, charged that standard cost systems were detrimental to competitiveness and lacked strategic focus. The crescendo was occasioned by the perceived loss of U.S. hegemony in the global marketplace. Critics of U.S. practices questioned many prevailing business and accounting practices, including standard costing. For example, a 1983 *Fortune* article (Bylinski, 1983, p. 128) reported Eli Goldratt's harsh comments about standard costing: 'He lashes out, for instance, at standard cost accounting procedures as "the No. 1 enemy of productivity—whether these procedures are used to price products, to justify capital investment, or to measure workers' and machines' efficiency"'.

An article by Edwards and Heard (1984), entitled 'Is Cost Accounting the No. 1 Enemy of Productivity?', was written, in part, as a rejoinder to Goldratt's comments about standard costing. It captured the self-doubt that many were feeling about accounting's role in industry. Edwards and Heard observed in conclusion: 'If he [Goldratt] is correct, management accounting must search for new manufacturing performance measures' (p. 44). Several other 1980s articles are worth noting. Hunt *et al.* (1985) questioned accounting's role in controlling labour given that Hewlett-Packard, one of the U.S.'s leading high-tech companies, no longer included direct labour as a separate product cost category. Brimson (1986) argued more generally that cost management systems failed to provide managers with the financial information they needed to manage the factories of the future. Shortly thereafter, Johnson and Kaplan (1987, p. 1) began their best-selling book with remarks that caused many academicians to rethink key assumptions of cost accounting practice: 'Today's management accounting information . . . is too late, too aggregated, and too distorted to be relevant for managers' planning and control decisions . . . Management accounting reports are of little help to operating managers as they attempt to reduce costs and improve productivity.'

In retrospect, the propriety and effectiveness of standard costing to achieve operational control may have been significantly oversold. Cost accounting 'snake oil' endured, at least in part, because accountants, who designed the content, format and distribution of cost reports, controlled the formal information system in most organizations. In this regard, Caplan (1966, p. 498) noted that 'decisions regarding what information is most critical, how it would be processed, and who should receive it are almost always made by accountants'. Accountants who maintained the conventional perspective ignored many behavioural assumptions which challenged the

¹⁵ See Parker *et al.* (1989) and Neimark (1990) for a detailed discussion of accounting literature in these areas.

propriety of closely monitoring subordinates. It appears that the effectiveness of standard costs was promulgated by accountants who accepted unequivocally the premises of a dominant, gender-privileged perspective—linear progress, upward mobility and equal opportunity (Harvey, 1989).

The myth of top-down cost control unravelled in the 1980s as the Japanese achieved manufacturing success by using bottom-up techniques that included quality management, worker empowerment, continuous improvement and total customer satisfaction. Howell (1988) presented many compelling arguments for abandoning the use of internally derived standards in the 'new manufacturing environment'. According to Howell, standard costs focused on specific goals and static conditions, while automated manufacturing environments were more flexible and dynamic. In addition, traditional variance analysis was not as important because automated manufacturing processes were far more consistent and reliable.

Johnson and Kaplan (1987) attributed cost accounting's 'lost relevance' in the 1925–80 period to the dominance of external financial reporting over management accounting, although their views have been challenged (Ezzamel *et al.*, 1990). More recently, Johnson (1992) argued that accounting control information generated since the 1950s was actually detrimental because it caused people to focus on the wrong things and encouraged manipulative behaviour.¹⁶ While many firms continue to use standard costs for control purposes, we believe that costing has come full circle and is returning to its decision-making and problem-solving roots. The next section of this article describes briefly the transition of standard costing to owner/managers' principal decision-making concern—strategic cost reduction.

A RETURN TO DECISION MAKING

A number of factors conjoined in the early 1980s to spur many U.S. and U.K. companies to re-examine the fundamentals of business. Japanese competitive pressures, the computer revolution, advancements in automated manufacturing and new management techniques stimulated major structural changes which included the downsizing of middle-management staff levels and the empowerment of multi-functional teams. These changes were undertaken, in part, to reduce unit costs, encourage entrepreneurship, and instill a culture of change and innovation. Ghosal and Bartlett (1995, p. 96) discussed the impact of these innovations in the U.S.: 'The new philosophy of organization and management is built on different assumptions about motivation and behavior. The entrepreneurial process assumes individuals *can* take initiative and it creates the context and the mechanism necessary for them to do so.'

Many leading organizations are eliminating vestiges of formal, control-type behaviour, including strict dress codes, structured managerial hierarchies and regular work hours. Others have democratized the workplace by eliminating job titles, private

¹⁶ For example, Johnson (1992, pp. 49, 96) concluded that 'achieving standard direct cost "efficiency" targets leads to larger batches, longer production runs, more scrap, more rework, and less communication across processes... In top-down accounting systems as we have known them since the 1950s, employees manipulate processes for fear of not achieving accounting results.'

secretaries and private offices, all in order to break down social barriers, improve communication and facilitate the interchange of ideas. For example, the financial success and informal work culture at Microsoft are now legendary. Peters (1994) described many unconventional behaviours that are encouraged in world-class organizations. He subtitled his latest book 'Crazy Times Call for Crazy Organizations' and called the first chapter, 'Toward the Abandonment of Everything'.

Organizations that continue to impose the social structures of an earlier era (seniority, hierarchy, bureaucracy and top-down control) are far less attractive to individuals who seek to express their ideas in open and tolerant work environments.¹⁷ Furthermore, the underpinning facet of control in many organizations—the clearly defined, closely monitored job function—is now questioned. We acknowledge that many companies electronically monitor performance more than they did in the past, but they are doing so primarily to protect customers and minimize potential litigation, rather than to control labour costs. The use of standard cost systems which depend on a clearly defined responsibility and accountability framework, top-down control and a set of early twentieth-century management principles could be detrimental to organizations that are confronted by competitors who apply unceasing pressure to increase value, improve quality and reduce unit costs.¹⁸ Thus, Puxty (1993, p. 143) noted, 'as we have lost faith in human rationality, so mathematical models based on rationality have appeared increasingly out of touch'. Johnson (1992, p. 119) argued this point even more explicitly: 'I see no positive contribution accounting control reports make to operations that would justify their continued production. *They provide no control information that is not otherwise better supplied by real-time charting of information from processes and customers*' (italics in original).

It is equally noteworthy that standard cost systems were designed originally for cost control rather than cost reduction, a fact that accounting's critics have rarely acknowledged. The National Association of Accountants (1958) expressed this point explicitly:

While it is sometimes said that an unattainable tight standard provides an incentive to reduce costs, it seems that this use of the standard confuses the objectives of cost reduction and cost control. Cost reduction proceeds by finding ways to achieve a given result through improved design, better methods, new layouts, incentive plans, etc. Hence cost reduction results in the establishment of new standards. On the other hand, cost control is a process of maintaining performance at as near existing standards as possible. (p. 9)

¹⁷ We concur with one reviewer who noted that just at a time when many private-sector organizations are now abandoning top-down control procedures, many in the public sector (like universities!) are acquiring, or exacerbating, the characteristics of top-down control and the potential for standard costing.

¹⁸ Many firms are recognized as continuing to employ standard costs for control. McKinnon and Bruns (1992) conducted interviews with seventy-three managers in twelve U.S. and Canadian firms and reported that many companies utilize a responsibility accounting framework. Harmon (1992, p. 295), a Big Six cost management consultant, concluded that 'companies using budget-based responsibility reporting of expenses will find that these systems will have continued usefulness in the future'.

Chua (1986) described two competing interpretations for internal cost controls—purposeful, rational, objective and designed to improve organizational efficiency, as typified by Chandler and Daems (1979); or social, political, non-objective and ideological, as described by Tinker *et al.* (1982). In either case, built-up, internally derived standard costs were developed in an era when controlling waste and inefficiency was the ultimate objective of an internal control system. In addition to outside demands on the firm, major advances in computerization and communication have further eroded the relevance of built-up standards. Networked, multi-task, user-friendly computers have linked individuals in and outside the organization, eliminated communicative boundaries and barriers (hierarchy, status, location, etc.), and mitigated the important communicative function that accounting control reports provided. Horngren (1989, p. 31) expressed this sentiment directly: ‘If everybody has the same information, the role of an accounting system is less important than if the system is a major conduit’. How quickly things change! Less than twenty years ago, Belkaoui (1980) explained why a formal cost control framework was necessary in his description of a work environment that no longer befits many leading organizations:

Vertical differentiation by authority and responsibility and horizontal differentiation through departmentalization or divisionalization lead to the creation of separate organizational units and necessitate provision for periodic planning and control. This need is only met by the management accounting system in general and responsibility accounting in particular. Management accounting will produce accounting reports of performance and budgets which will serve as the means of communication between different functional units. (p. 35)

As mentioned, several noted scholars have criticized the utility of labour-based standard costing systems (Johnson and Kaplan, 1987; Johnson, 1992). Many U.S. companies have implemented activity-based costing (ABC) systems, in part to correct deficiencies identified in the literature. While the advantages of ABC systems have been widely promoted (more accurate costs, better pricing decisions, greater cost reduction opportunities identified, etc.), the ABC approach remains conventional in that costs continue to be built up. Another approach is to compute long-term, externally focused cost targets that stress strategic (market share, price leadership, etc.) rather than operational objectives. Thus, according to Shank and Govindarajan (1989, p. xi), ‘accounting exists . . . to facilitate the development and implementation of business strategy’.¹⁹

We believe that more firms will make cost reduction their fundamental long-term strategy, although the change will not be easy. Shillinglaw (1989, p. 41) described the shift from cost control to cost reduction as ‘a radical change in focus’. We also concur with Shields and Young (1992, p. 16) who wrote that, ‘effective long-term cost reduction is a continuous activity that must be a strategic and cultural priority’.

¹⁹ Many proponents of ABC also contend that it is well-suited to serve strategic goals. Pare (1993) discussed the strategic benefits that ABC provides in the areas of quality improvement, faster throughput and customer relations. See Shank and Govindarajan (1989, 1992) for a detailed discussion of strategic cost analysis. Bromwich and Bhimani (1991, 1994) described the closely related area of strategic management accounting.

To meet strategic targets many companies have begun to benchmark their costs against those of leading competitors, mandated both by customer and competitive demands for higher quality, greater value and lower costs.²⁰

As historians, we find it most interesting that benchmarking was avidly undertaken by Andrew Carnegie over 120 years ago. Carnegie's biographer made the following remarks about the most successful U.S. business entrepreneur of the nineteenth century (Wall, 1970, p. 337): 'Costs would always be Carnegie's obsession in business, and his constant concern to reduce them in every department was to a large measure the secret of his success'. Johnson (1981) noted similarly that Carnegie routinely compiled and compared his unit costs against competitors.

SUMMARY AND CONCLUSIONS

This article described the use of costs and other management practices in U.K. and U.S. industrial organizations. It determined that past or expected actual cost data were used initially in pricing, outsourcing and other decisions, but found no evidence that costs were norm-based or were used to monitor and evaluate subordinates. In later years, labour control was derived from carefully computed piece rates that generated decent living wages for average workers who produced a particular level of output. Starting in the late nineteenth century, U.S. industrial engineers began to promote the benefits of systematic management procedures to manage the complexities of large, mass-production factories. In the early twentieth century, calls were made for these procedures to become scientifically based in order to identify the most efficient way to complete tasks and minimize waste. The proponents of standard costing were consultants who had a vested interest in recommending norm-based standard costs and then designing detailed standard cost systems. Church (1914), Harrison (1921) and others argued that standard costs would facilitate hierarchical control by monitoring operations and communicating information about managerial and subordinate performance. Notwithstanding the logic of waste reduction, as well as society's general receptivity to this appeal, the actual use of standard costs to establish individual accountability is extremely problematic. Simply put, there is a paucity of positive evidence showing that cost standards were developed, implemented and effectively used in the pristine form that Taylor and others advocated so passionately. In reality, owners, workers, foremen and especially managers resisted the introduction of scientific management and standard costing. Nelson (1974, p. 496) discussed the source of resistance to scientific management and concluded that, 'in the twenty-nine factories examined here, Taylor's followers encountered more opposition from the managers than from the workers. In some cases it came from the highest levels.'

²⁰ In the U.S. the Institute of Management Accountants established the Continuous Improvement Center (CIC) in 1993. For an annual fee of \$10,000, many world-class companies (Motorola, Toyota and Xerox, amongst others) provide selected financial and cost data to the CIC's common data base and are able to benchmark their performance measures against best practices and, thus, rationalize cost reduction efforts.

In recent years, in response to the confluence of global competitive pressures, rapid technological advancements and liberating cultural forces, leading organizations have moved beyond operational control and towards quality improvement and customer satisfaction. In spirit, these organizations manifest many features that characterized industrial organizations of earlier eras, including open communication structures; fewer layers of management; unclear boundaries between work, home and leisure; and the use of competitor benchmarks to identify best practices and lowest unit costs. Thus, standard costing for control has been superseded by target costing for continuous cost reduction.

REFERENCES

- American State Papers, Class V, Military Affairs, II, Document 246, 'Armory at Springfield', communicated to the House of Representatives by the Committee on Military Affairs, 3 March 1823.
- Barbash, J., *Labor Unions in Action*, Harper, 1948.
- Belkaoui, A., *Conceptual Foundations of Management Accounting*, Addison-Wesley, 1980.
- Boyns, T., and J. R. Edwards, 'Cost and Management Accounting in Early Victorian Britain: A Chandalresque Analysis?', *Management Accounting Research*, March 1995.
- Braverman, H., *Labor and Monopoly Capital*, Monthly Review Press, 1974.
- Brief, R., 'Nineteenth Century Accounting Error', *Journal of Accounting Research*, Spring 1965.
- Brimson, J. A., 'How Advanced Manufacturing Technologies are Reshaping Cost Management', *Management Accounting*, March 1986.
- Bromwich, M., and A. Bhimani, 'Strategic Investment Appraisal', *Management Accounting*, March 1991.
- , *Management Accounting: Pathways to Progress*, Chartered Institute of Management Accountants, 1994.
- Brown, J. K., *The Baldwin Locomotive Works, 1831–1915: A Case Study in the Capital Equipment Sector*, J. K. Brown, 1992.
- Brummet, R. L., *Overhead Costing*, Bureau of Business Research, 1957.
- Bylinski, G., 'An Efficiency Guru with a Brown Box', *Fortune*, 5 September 1983.
- Caplan, E. H., 'Behavioral Assumptions of Management Accounting', *The Accounting Review*, July 1966.
- Chamberlain, N. W., *Collective Bargaining*, McGraw-Hill, 1951.
- Chandler, A. D., *The Visible Hand: The Managerial Revolution in American Business*, Harvard University Press, 1977.
- Chandler, A. D., and H. Daems, 'Administrative Co-Ordination, Allocation and Monitoring: A Comparative Analysis of the Emergence of Accounting and Organization in the U.S.A. and Europe', *Accounting, Organizations and Society*, Vol. 4, Nos 1/2, 1979.
- Chapman, S. D., *The Early Factory Masters*, David & Charles, 1967.
- Chatfield, M., *A History of Accounting Thought*, Robert E. Krieger, 1977.
- Chua, W. F., 'Radical Developments in Accounting Thought', *The Accounting Review*, October 1986.
- Church, A. H., 'The Proper Distribution of Establishment Charges', *The Engineering Magazine*, July–December 1901.
- , *The Science and Practice of Management*, The Engineering Magazine Co., 1914.
- Clawson, D., *Bureaucracy and the Labor Process*, Monthly Review Press, 1980.
- Committee on Cost Concepts and Standards, 'Tentative Statement of Cost Concepts Underlying Reports for Management Purposes', *The Accounting Review*, April 1956.
- Crossman, P., 'The Genesis of Cost Control', *The Accounting Review*, July 1953.
- Devine, C. T., *Cost Accounting and Analysis*, Macmillan, 1950.

STANDARD COSTING: FROM DECISION MAKING TO CONTROL

- Deyrup, F. J., *Arms Making in the Connecticut Valley*, George Shumway, 1970.
- Edwards, J. B., and J. A. Heard, 'Is Cost Accounting the No. 1 Enemy of Productivity?', *Management Accounting*, June 1984.
- Edwards, J. R., 'Industrial Cost Accounting Developments in Britain to 1830: A Review Article', *Accounting and Business Research*, Autumn 1989.
- Edwards, J. R., and T. Boyns, 'Industrial Organization and Accounting Innovation: Charcoal Ironmaking in England 1690–1783', *Management Accounting Research*, June 1992.
- Edwards, J. R., G. Hammersley and E. Newell, 'Cost Accounting at Keswick England, c. 1598–1615: The German Connection', *The Accounting Historians Journal*, June 1990.
- Edwards, J. R., and E. Newell, 'The Development of Cost and Management Accounting Before 1850: A Survey of the Evidence', *Business History*, January 1991.
- Edwards, R. S., 'Some Notes on the Early Literature and Development of Cost Accounting in Great Britain', *The Accountant*, July–December 1937.
- Eggleston, D. C., 'System of Factory Cost Accounting', *Journal of Accountancy*, December 1906.
- Emerson, H., 'Efficiencies as a Basis for Operation and Wages', *The Engineering Magazine*, July 1908–February 1909.
- Epstein, M. J., *The Effect of Scientific Management on the Development of the Standard Cost System*, Arno Press, 1978.
- Euphemia, K. (ed.), *Letters of Josiah Wedgwood*, E. J. Morten, 1973.
- Ezzamel, M., K. Hoskin and R. Macve, 'Managing it All by Numbers: A Review of Johnson and Kaplan's Relevance Lost', *Accounting and Business Research*, Spring 1990.
- Fleischman, R. K., K. Hoskin and R. Macve, 'The Boulton & Watt Case: The Crux of Alternative Approaches to Accounting History?', *Accounting and Business Research*, Summer 1995.
- Fleischman, R. K., and L. D. Parker, 'Managerial Accounting Early in the British Industrial Revolution: The Carron Company, a Case Study', *Accounting and Business Research*, Summer 1990.
- , 'British Entrepreneurs and Pre-Industrial Revolution Evidence of Cost Management', *The Accounting Review*, April 1991.
- , 'The Cost Accounting Environment in the British Industrial Revolution Iron Industry', *Accounting, Business and Financial History*, September 1992.
- , *What is Past is Prologue: Cost Accounting in the British Industrial Revolution 1760–1850*, Garland, 1997.
- Fleischman, R. K., and T. N. Tyson, 'Cost Accounting During the Industrial Revolution: The Present State of Historical Knowledge', *Economic History Review*, August 1993.
- , 'A Guide to the Historical Controversies and Organizational Contexts of Standard Costs', *Journal of Accounting Education*, Spring 1996a.
- , 'Inside Contracting at the Waltham Watch Company: Reassessing the Economic Rationalist and Labour Process Perspectives', *Accounting, Auditing and Accountability Journal*, Vol. 9, No. 3, 1996b.
- Flinn, M. W. (ed.), *The Law Book of the Crowley Ironworks*, Andrews, 1957.
- , *Men of Iron: The Crowleys in the Early Iron Industry*, Edinburgh University Press, 1962.
- , *The History of the British Coal Industry*, Vol. 2, Clarendon Press, 1984.
- Garcke, E., and J. M. Fells, *Factory Accounts, Their Principle and Practice*, 1887; Arno Press reprint, 1976.
- Garner, S. P., *Evolution of Cost Accounting to 1925*, University of Alabama Press, 1954.
- Ghosal, S., and C. Bartlett, 'Changing the Role of Top Management: Beyond Structure to Processes', *Harvard Business Review*, January–February 1995.
- Gilbreth, F. B., *Primer of Scientific Management*, D. Van Nostrand Co., 1914.
- Goetz, B. E., *Management Planning and Control*, McGraw Hill, 1949.
- Gomberg, W., 'Union Interest in Engineering Techniques', *Harvard Business Review*, Spring 1946.
- Greer, H. C., 'Managerial Accounting—Twenty Years From Now', *The Accounting Review*, April 1954.

- Hallbauer, R. C., 'Standard Costing and Scientific Management', *The Accounting Historians Journal*, December 1978.
- Harmon, R. L., *Reinventing the Factory II*, Free Press, 1992.
- Harrison, G. C., 'Cost Accounting to Aid Production', *Industrial Management*, October 1918–June 1919.
- , *Cost Accounting to Aid Production*, The Engineering Magazine Company, 1921.
- Harvey, D., *The Condition of Postmodernity*, Basil Blackwell, 1989.
- Hopper, T. M., and P. Armstrong, 'Cost Accounting, Controlling Labour and the Rise of Conglomerates', *Accounting, Organizations and Society*, Vol. 16, Nos 5/6, 1991.
- Hopwood, A. G., 'An Empirical Study of the Role of Accounting Data in Performance Evaluation', *The Journal of Accounting Research*, Supplement, *Empirical Research in Accounting*, 1972.
- , 'The Archaeology of Accounting Systems', *Accounting, Organizations and Society*, Vol. 12, No. 3, 1987.
- Horngren, C. T., 'Cost and Management Accounting: Yesterday and Today', *Journal of Management Accounting Research*, Fall 1989.
- Hoskin, K. W., and R. H. Macve, 'The Genesis of Accountability: The West Point Connections', *Accounting, Organizations and Society*, Vol. 13, No. 1, 1988a.
- , 'Cost Accounting and the Genesis of Managerialism: The Springfield Army Episode', *Proceedings of the Second Interdisciplinary Perspectives on Accounting Conference*, University of Manchester, 1988b.
- , 'Reappraising the Genesis of Managerialism: A Re-Examination of the Role of Accounting at the Springfield Armory 1815–1845', *Accounting, Auditing and Accountability Journal*, Vol. 7, No. 2, 1994.
- Hounshell, D. A., *From the American System to Mass Production 1800–1932*, Johns Hopkins University Press, 1984.
- Howell, R., *After Product Costing: New Frontiers for Management Accounting*, paper presented at the National Association of Accountants' Third Annual Cost Conference, 1988.
- Hoxie, R. F., *Scientific Management and Labor*, D. Appleton, 1915.
- Hudson, P., 'Some Aspects of Nineteenth Century Accounting Development in the West Riding Textile Industry', *Accounting History*, Vol. 2, Part 2, 1977.
- Hunt, R., L. Garrett and C. M. Merz, 'Direct Labor Cost Not Always Relevant at H-P', *Management Accounting*, February 1985.
- John, A. H. (ed.), *Minutes Relating to Messrs. Samuel Walker & Company Rotherham*, Council for the Preservation of Business Archives, 1951.
- Johnson, H. T., 'Early Cost Accounting for Internal Control: Lyman Mills in the 1850s', *Business History Review*, Winter 1972.
- , 'Toward a New Understanding of Nineteenth-Century Cost Accounting', *The Accounting Review*, July 1981.
- , *Relevance Regained: From Top-Down Control to Bottom-up Empowerment*, Free Press, 1992.
- Johnson, H. T., and R. S. Kaplan, *Relevance Lost: The Rise and Fall of Management Accounting*, Harvard Business School Press, 1987.
- Jones, H., *Accounting, Costing, and Cost Estimation: Welsh Industry 1700–1930*, University of Wales Press, 1985.
- Knoeppel, C. E., 'Systematic Foundry Operation and Foundry Costing', *The Engineering Magazine*, October 1908–March 1909.
- Lister, R. J., 'Accounting as History', *International Journal of Accounting*, Spring 1983.
- Litterer, J. A., 'Systematic Management: Design for Organizational Recoupling in American Manufacturing Firms', *Business History Review*, Vol. 37, No. 4, 1963.
- Littleton, A. C., *Accounting Evolution to 1900*, American Institute, 1933.
- Loft, A., 'Towards a Critical Understanding of Accounting: The Case of Cost Accounting in the U.K., 1914–1925', *Accounting, Organizations and Society*, Vol. 11, No. 2, 1986.

STANDARD COSTING: FROM DECISION MAKING TO CONTROL

- , *Coming into the Light*, Chartered Institute of Management Accountants, 1990.
- Marshall, G., *Presbyters and Profits*, Clarendon Press, 1980.
- McGaw J. A., 'Accounting Innovation: Technological Change and Business Practice in the Berkshire County Paper Industry', *Technology and Culture*, October 1985.
- McKendrick, N., 'Josiah Wedgwood: An Eighteenth-Century Entrepreneur in Salesmanship and Marketing Techniques', *Economic History Review*, Vol. 12, No. 3, 1960.
- , 'Josiah Wedgwood and Thomas Bentley: An Inventor-Entrepreneur Partnership in the Industrial Revolution', *Transactions of the Royal Historical Society*, 5th Series, Vol. 23, No. 1, 1964.
- , 'Josiah Wedgwood and Cost Accounting in the Industrial Revolution', *Economic History Review*, April 1970.
- McKinnon, S. M., and W. J. Bruns, Jr., *The Information Mosaic*, Harvard Business School Press, 1992.
- McLean, T., 'Agent's Reputation, Accounting and Costing in Organizational Control Structures', *The Accounting Historians Journal*, June 1997.
- Metcalfe, H., *The Cost of Manufactures*, John Wiley, 1885.
- Miller, P., and C. Napier, 'Genealogies of Calculation', *Accounting, Organizations and Society*, Vol. 18, Nos 7/8, 1993.
- Miller, P., and T. O'Leary, 'Accounting and the Construction of the Governable Person', *Accounting, Organizations and Society*, Vol. 12, No. 3, 1987.
- National Association of Cost Accountants, 'The Uses and Classifications of Costs', in D. Solomons (ed.), *Studies in Cost Analysis*, 2nd ed., Richard D. Irwin, 1968.
- National Association of Cost Accountants Research Staff, *How Standard Costs Are Being Used*, National Association of Cost Accountants, 1958.
- Neimark, M., 'The King is Dead. Long Live the King!', *Critical Perspectives on Accounting*, March 1990.
- Nelson, D., 'Scientific Management, Systematic Management, and Labor, 1880-1915', *Business History Review*, Vol. 48, No. 4, 1974.
- , *Managers and Workers: Origins of the New Factory System in the United States 1880-1920*, University of Wisconsin Press, 1979.
- Norton, G. P., *Textile Manufacturers' Bookkeeping for the Counting House, Mill and Warehouse*, Simplin, Marshall, Hamilton, Kent, 1889.
- Oakes, L. S., and P. J. Miranti, Jr., 'Louis D. Brandeis and Standard Cost Accounting: A Study of the Construction of Historical Agency', *Accounting, Organizations and Society*, Vol. 21, No. 6, 1996.
- Oldroyd, D., 'The Costing Records of George Bowes and the Grand Allies in the North-East Coal Trade in the Eighteenth Century: Their Type and Significance', *Accounting, Business and Financial History*, March 1996.
- Pare, T. P., 'A New Tool for Managing Costs', *Fortune*, 14 June 1993.
- Parker, L. D., K. R. Ferris and D. T. Otley, *Accounting for the Human Factor*, Prentice-Hall, 1989.
- Parker, R. H., *Management Accounting: An Historical Perspective*, Augustus Kelley, 1969.
- , *The Development of the Accountancy Profession in Britain to the Early Twentieth Century*, Academy of Accounting Historians, 1986.
- Perren, A., 'The Development of Cost Accounting in Europe', *N.A.C.A. Bulletin*, June 1944.
- Peters, T., *The Tom Peters Seminar: Crazy Times Call for Crazy Organizations*, Vintage Books, 1994.
- Pollard, S., *The Genesis of Modern Management*, Harvard University Press, 1965.
- , 'Industrial Management and the Beginning of Industrialization in Europe', *L'Impresa Industriale Commercio Banco*, April-May 1990.
- Puxty, A. G., *The Social and Organizational Context of Management Accounting*, Academic Press, 1993.
- Raistrick, A., *Dynasty of Iron Founders*, David & Charles, 1970.
- Rimmer, W. G., *Marshall's of Leeds Flax-Spinners 1788-1886*, Cambridge University Press, 1960.
- Roll, E., *An Early Experiment in Industrial Organization: Being a History of the Firm of Boulton & Watt, 1775-1805*, Augustus Kelley, 1930; reprint, 1968.

- Shank, J. K., and V. Govindarajan, *Strategic Cost Analysis: The Evolution from Managerial to Strategic Accounting*, Richard D. Irwin, 1989.
- , 'Strategic Cost Analysis of Technological Investments', *Sloan Management Review*, Fall 1992.
- Shields, M. D., and S. M. Young, 'Effective Long-Term Cost Reduction: A Strategic Perspective', *Journal of Cost Management*, Spring 1992.
- Shillinglaw, G., 'Managerial Cost Accounting: Present and Future', *Journal of Management Accounting Research*, Fall 1989.
- Simon, H. A., H. Guetzkow, G. Kozmetsky and G. Tyndall, *Centralization vs. Decentralization in Organizing the Controller's Department*, Controllorship Foundation, 1954.
- Smallpeice, B., 'The Evolution of Industrial Accounting', *The Accountant*, 1 October 1949.
- Solomons, D., *Studies in Costing*, Sweet & Maxwell, 1952.
- Sowell, E. M., *The Evolution of the Theories and Techniques of Standard Costs*, University of Alabama Press, 1973.
- Stacey, N. A. H., *English Accountancy 1800–1954*, Gee & Co., 1954.
- Stone W. E., 'An Early English Cotton Mill Cost Accounting System: Charlton (sic) Mills, 1810–1889', *Accounting and Business Research*, Winter 1973.
- Tann, J. (ed.), *The Selected Papers of Boulton and Watt*, Diploma, 1981.
- Taylor, F. W., *The Principles of Scientific Management*, 1911; W. W. Norton reprint, 1967.
- Tinker, A., B. D. Merino and M. D. Neimark, 'The Normative Origins of Positive Theories: Ideology and Accounting Thought', *Accounting, Organizations and Society*, Vol. 7, No. 2, 1982.
- Toms, J. S., 'Managers and Capitalists at the Turning Point of the Industrial Revolution: Conflict and Cooperation in the Leading Export Sector, 1890–1914', paper presented at the Fifth Annual Accounting, Business and Financial History Conference, Cardiff, Wales, 1993.
- Towne, H. R., 'The Engineer as an Economist', *Transactions of the American Society of Mechanical Engineers*, May 1885.
- Tyson, T. N., 'The Nature and Function of Cost Keeping in a Late Nineteenth-Century Small Business', *The Accounting Historians Journal*, June 1988.
- , 'Accounting for Labor in the Early Nineteenth Century: The U.S. Arms Making Experience', *The Accounting Historians Journal*, June 1990.
- , 'The Nature and Environment of Cost Management Among Early Nineteenth Century U.S. Textile Manufacturers', *The Accounting Historians Journal*, June 1992.
- , 'Keeping the Record Straight: Foucauldian Revisionism and 19th Century U.S. Cost Accounting History', *Accounting, Auditing and Accountability Journal*, Vol. 6, No. 2, 1993.
- , 'Collective Bargaining and Cost Accounting: The Case of the U.S. Men's Clothing Industry', *Accounting and Business Research*, Winter 1994.
- , 'A Past as Participants Knew It: Piece Rates, Time Study, Standard Costs, and New Technology in the U.S. Men's Tailored Clothing Industry', *Management Accounting Research*, September 1996.
- Unwin, G., *Samuel Oldknow and the Arkwrights*, Manchester University Press, 1924.
- Wall, J. F., *Andrew Carnegie*, Oxford University Press, 1970.
- Walsh, E. J., and R. E. Stewart, 'Accounting and the Construction of Institutions: The Case of a Factory', *Accounting, Organizations and Society*, Vol. 18, Nos 7/8, 1993.
- Wells, M. C., *Accounting for Common Costs*, Center for International Education and Research in Accounting, 1978.
- Whitmore, J., 'Shoe Factory Accounts', *The Journal of Accountancy*, May 1908.
- Yamey, B. S., 'Scientific Bookkeeping and the Rise of Capitalism', *Economic History Review*, Vol. 1, Nos 2/3, 1949.
- , 'The Development of Company Accounting Conventions', *Three Banks Review*, Vol. 47, 1960.
- Yates, J., *Control through Communication*, Johns Hopkins University Press, 1989.

APPENDIX

ARCHIVAL LOCATIONS

Firm	Industry	Location(s) of records
Abersychan	Iron	Gwent Records Office
Ashworth (H. & E.)	Cotton	Lancashire Records Office, Staffordshire Records Office, Rylands Library (Manchester)
Barraclough (John)	Silk	West Yorkshire Archives (Calderdale)
Birtley Mine	Coal	Durham Records Office
Boulton & Watt	Machining	Birmingham Central
Bury (James)	Calico	Manchester Central
Butterley	Iron	Derbyshire Records Office
Carron	Iron	West Register House, Edinburgh
Clydach	Iron	National Library of Wales, Aberystwyth
Cyfarthfa	Iron	National Library of Wales, Aberystwyth
Darby	Iron	Shrewsbury Public, Shropshire Records Office, Ironbridge Gorge Museum
Dowlais	Iron	Glamorganshire Records Office
Ecton Mine	Copper	Staffordshire Records Office
Elsecar Old Colliery	Coal	Sheffield Archives
Finlay (James)	Cotton	Glasgow University
Gott (Benjamin)	Wool	Leeds University
Greg (R.)	Cotton	Manchester Central
Herculaneum	Pottery	Liverpool Central
High Rake Mine	Lead	Sheffield Archives
Horrocks, Crewdson	Cotton	Lancashire Records Office
Johnson (viewbook)	Coal	Tyne and Wear Records Office
Lanark Twist	Cotton	Glasgow University
Marshall (John)	Flax	Leeds University
McConnel & Kennedy	Cotton	Rylands Library (Manchester)
Middleton Colliery	Coal	West Yorkshire Archives (Leeds)
Mona Mine	Copper	Bangor University
Murgatroyd (John)	Worsteds	West Yorkshire Archives (Calderdale)
Newcastle mine owners	Coal	Northumberland Records Office
Oldknow (Samuel)	Cotton	Rylands Library (Manchester)
Pease (Henry)	Worsteds	Nottinghamshire Records Office
Philips (J. & N.)	Tape	Staffordshire Records Office
Stansfeld	Wool	West Yorkshire Archives (Calderdale)
Stella	Coal	Durham Records Office
Strutt (W. G. & J.)	Cotton	Manchester Central
Vivian	Iron	National Library of Wales, Aberystwyth

PAMELA KENT AND RON WEBER

Auditor Expertise and the Estimation of Dollar Error in Accounts

A major task that auditors undertake in formulating their audit opinion is to estimate the dollar error that might exist in accounts in light of their evaluation of internal control strengths and weaknesses. The research that has been undertaken to evaluate the quality of auditor performance on this task, however, has produced mixed results. The current study tries to overcome some theoretical limitations and measurement limitations that have undermined prior studies. Forty practising auditors rated their abilities on fourteen characteristics derived from a model of expertise. They then undertook an experiment where they judged the extent of dollar error that might exist in the inventories of a manufacturing company. They based their judgments on working papers provided to them that contained, among other information, an evaluation of the company's internal control system. An estimate of the 'true' dollar error in the inventories was calculated using a program that simulated the company's internal control and accounting system. This estimate was then used to calculate the accuracy of the auditors' judgments. Their ratings on the expertise characteristics were not related to their judgment accuracy. Their ratings were related, however, to their confidence in their judgment accuracy. Auditors who considered themselves more expert at the task were more confident in their judgment accuracy but they were, in fact, no more accurate than auditors who considered themselves to be less expert at the task.

Key words: Accounts; Accuracy; Auditing; Expertise; Internal control; Judgment; Sampling.

A major task that auditors undertake in formulating their audit opinion is to estimate the dollar error that might exist in accounts in light of their evaluation of internal control strengths and weaknesses. This decision is made either formally or informally when they undertake account-specific planning. It is critical because it affects their determination of the nature and extent of substantive testing they will subsequently undertake. Sometimes it also directly affects the audit opinion they issue.

PAMELA KENT is Senior Lecturer and RON WEBER is Professor of Information Systems in the Department of Commerce, University of Queensland.

We are indebted to partners and fifty-six auditors in three chartered accounting firms for assisting us in the survey component of this research. We are particularly indebted to a partner, a manager, and forty auditors in a chartered accounting firm for assisting us in the experimental component of this research. Thanks also to Ken Trotman and Jon Heales for advice on the research and to Francis Chan for research assistance. Sarah Bonner, Arnie Wright, Ted Mock, Gary Monroe, Dan O'Leary, Peter Brownell, participants in workshops at the University of Southern California and Edith Cowan University and two reviewers also provided helpful comments on the article. This research was supported by a Special Projects Grant from the University of Queensland and a grant from GWA Ltd.

In spite of the importance of this decision, few researchers have investigated how well it is made and the factors that lead to or detract from auditors' judgment quality. The small amount of research that has been undertaken to evaluate how well the decision is made suggests auditors are likely to perform poorly (Weber, 1978; Kinney and Uecker, 1982; Tomassini *et al.*, 1982; Biggs and Wild, 1985; Shields *et al.*, 1987). The reasons, however, are unclear.

BACKGROUND TO THE RESEARCH

An important question we face in our research is whether, in light of an internal controls evaluation, auditors are ever likely to perform well when they estimate the dollar error that might exist in specific accounts. On the one hand, Bonner and Pennington (1991) point out that the judgment task is based on statistical reasoning where the underlying knowledge lacks structure and depth. Audit research results confirm behavioural decision-theory research results, which indicate that humans often do not perform well under these circumstances.

On the other hand, the task of estimating the dollar error in accounts also involves cognitive processes that research has shown auditors perform well. For example, to undertake the task, auditors must retrieve knowledge from memory and from external sources, comprehend this knowledge, and generate and evaluate hypotheses. Providing the internal control strengths and weaknesses that auditors observe are encountered frequently, and the causal model that relates these strengths and weaknesses to errors in an account is clear, they may make high-quality judgments (Bonner and Pennington, 1991).

In light of this uncertainty about whether auditors will be able to manifest expertise in the judgment task that was the focus, we sought, therefore, to provide a sound theoretical basis for our research. We sought, also, to overcome some methodological limitations that appear to have undermined the results obtained in prior research. In the following subsections, we briefly describe the theory used as the basis for our research. In addition, we discuss the steps undertaken to overcome some methodological limitations that we perceive to be important.

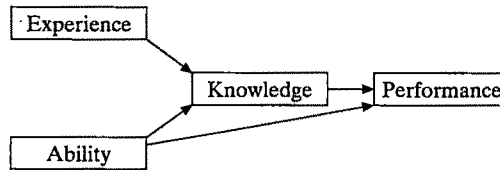
Theoretical Concerns

A substantial amount of research has now been undertaken to try to identify the determinants of judgment performance in auditing. Unfortunately, the results obtained from much of this research have been equivocal (Bédard, 1989, 1991; Bédard and Chi, 1994). Recent work by Libby and Luft (1993) and Libby and Tan (1994), however, has provided some promising insights into the potential determinants of expertise. Figure 1 shows the model they have proposed. In this model, experience, ability and knowledge factors are postulated to impact task performance.

From the viewpoint of our research, two aspects of the model shown in Figure 1 are important. First, the model postulates that ability and knowledge will have important *direct* effects on judgment performance. In this research, therefore, we obtained measures of both ability and knowledge to determine whether they were associated with measures of how well auditors estimated the dollar error

FIGURE 1

DETERMINANTS OF AUDIT JUDGMENT PERFORMANCE



Reprinted from *Accounting, Organisations and Society*, Vol. 18, R. Libby and J. Luft, 'Determinants of Judgment Performance in Accounting Settings', pp. 425–50, 1993, with kind permission from Elsevier Science Ltd, The Boulevard, Longford Lane, Kidlington OX5 1GB, U.K.

that existed in accounts. We chose not to obtain measures of experience, however, because the model postulates that experience effects primarily will be mediated by knowledge effects. Second, unlike much prior research, we obtained multiple measures of ability and knowledge. In this regard, Libby and Tan (1994) point out that the types of ability and knowledge that impact performance are likely to vary depending on the judgment task to be undertaken. For example, it appears that auditors' general problem-solving ability is likely to have a more significant impact on their performance when the task they undertake is unstructured and the environment in which the task is learned is 'impoverished'. In the absence of good theory to link various types of ability and knowledge to judgment performance, however, we deemed it best to use multiple measures rather than a single measure of each.

Performance Measurement Validity and Reliability Concerns

An important criticism of prior relevant studies is that they may have used invalid and unreliable measures of judgment performance. For example, judgment consensus has often been used as a measure of judgment performance because consensus is easier to assess than judgment accuracy. Wright (1988) points out, however, that consensus might be a poor measure of judgment performance because auditors could agree on a judgment but nonetheless their judgment might still be inaccurate. He cautions against the ongoing use of consensus as a proxy for judgment accuracy and as a measure of judgment performance.

In our research, therefore, we endeavoured to use a valid and reliable measure of judgment performance. Specifically, we sought to measure the *accuracy* of auditor judgments rather than to rely on measures like consensus. In this regard, only a handful of prior studies have addressed the difficult problem of measuring the accuracy of auditor judgments (e.g., Kida, 1980; Bonner and Lewis, 1990; Pincus, 1991). We believe our research differs from these studies, however, because our participants undertook a broader, more complex task than participants in these studies.

Task-Confounding Concerns

The mixed results obtained in prior research on the quality of auditor judgment and the effects of various measures of experience, ability and knowledge could have

occurred because variations in task complexity may have produced confoundings. In this regard, Bonner (1994) argues that expertise may have greater effects on performance as task complexity increases. These effects may be obtained, however, only within a 'relevant range'. If task complexity is very low, expertise may have no effect. If task complexity is too high, however, expertise again may have no effect.

We deliberately chose the judgment task used in our research so it involved moderate amounts of complexity. In terms of Bonner's (1994) model of audit task complexity, the task we used in our empirical work had moderate amounts of input which had moderate clarity, fairly high amounts of processing with relatively low clarity, and small amounts of output with high clarity. Thus, the task should have been difficult, but not impossible, and within the 'relevant range' for expertise to have an effect.

Required Level of Expertise Concerns

Some prior research also may have failed to match the expertise of auditors who participated in the research with the demands of the task they were given. It is a well-known finding that expertise effects quickly dissipate when experts perform tasks outside the domain in which they excel (Shanteau, 1992). As a result, a number of researchers have argued that the knowledge, experience and cognitive abilities of auditors who participate in research should be appropriate for the kinds of tasks they are required to undertake if expertise effects are to be evident (see, e.g., Biggs and Mock, 1983; Abdolmohammadi and Wright, 1987; Wright, 1988; Colbert, 1989; Bonner and Pennington, 1991; Libby and Luft, 1993). When a suitable match has been achieved, the empirical results have been more compelling (see, e.g., Frederick and Libby, 1986; Bonner, 1990; Bonner and Lewis, 1990; Libby and Frederick, 1990; Libby and Tan, 1994).

Our measures of knowledge and ability took into account the specific demands of the task that our participants undertook. While we evaluated their ability and knowledge in a number of ways, the importance of each measure was evaluated relative to the task they were required to undertake. Hopefully, therefore, the effects of confoundings associated with a poor match between the audit expertise of our participants and the tasks they undertook will have been mitigated.

PROPOSITIONS INVESTIGATED

Given Figure 1, the first three propositions we investigated in our research are straightforward:

Proposition 1: Auditors who have higher levels of *ability* will have higher levels of *knowledge* in relation to the task of estimating the dollar error that might exist in an account.

Proposition 2: Auditors who have higher levels of *ability* will make more *accurate* judgments when they use the results of an internal control evaluation to assess the dollar error that might exist in an account.

Proposition 3: Auditors who have higher levels of *knowledge* will make more *accurate* judgments when they use the results of an internal control evaluation to assess the dollar error that might exist in an account.

Clearly, a critical aspect of superior judgment performance is greater judgment accuracy. Indeed, Wright (1988, p. 308) considers judgment accuracy to be the 'primary performance dimension' of auditor expertise. Experts must be able to demonstrate they make more accurate judgments than non-experts. Otherwise, their claim of expertise, irrespective of any superior performance they demonstrate on other aspects of a task, is likely to be contentious.

While judgment accuracy was the primary focus in our research, we also chose to investigate judgment confidence because we believe it is a critical aspect of task performance when judgments must be made on whether errors exist in accounts. If auditors are not confident in their judgments (irrespective of whether they are accurate), they are likely to encounter difficulties in convincing their clients that the audit they are conducting is effective and efficient. Moreover, we doubt they will make sound judgments about the subsequent audit procedures they should undertake because they will be plagued by doubts about their earlier judgments. Thus, the fourth and fifth propositions postulate an association between the ability and knowledge aspects of expertise and confidence in judgment accuracy:

Proposition 4: Auditors who have higher levels of *ability* will be more *confident* in their judgment accuracy when they use the results of an internal control evaluation to assess the dollar error that might exist in an account.

Proposition 5: Auditors who have higher levels of *knowledge* will be more *confident* in their judgment accuracy when they use the results of an internal control evaluation to assess the dollar error that might exist in an account.

With these two propositions, note that we have adopted an *output* view of confidence rather than a *process* view (Pincus, 1991). In other words, we see audit confidence as being related to an auditor's subjective assessment of their having reached a correct decision rather than their using confidence as a threshold to govern the nature and extent of their evidence-gathering activities. We agree that confidence may indeed play a process role in judgment processes. Nevertheless, experts should still manifest greater confidence in their judgment accuracy because they know more about the task. No amount of additional data gathering should allow non-experts to reach the confidence levels exhibited by experts simply because the former know less about the judgment task.

RESEARCH METHOD

To test the five research propositions, both a survey and a laboratory experiment were undertaken. The following subsections describe the nature of and conduct of our empirical work.

Participants

Two groups of practising auditors participated in the research.¹ The first group completed an instrument designed to measure the levels of auditor ability and knowledge associated with the audit of manufacturing inventories. There were thirty-three auditors from one office of a Big Six firm, sixteen auditors from one office of another Big Six firm, and seven auditors from one office of a medium-sized chartered accounting firm—a total of fifty-six auditors in the first group. They had a diverse range of audit experience, and their seniority levels ranged from junior to partner.

The second group comprised forty practising auditors from one office of a chartered accounting firm. This group also completed the instrument designed to measure auditor ability and knowledge in relation to the audit of manufacturing inventories. In addition, they also participated in the experiment we conducted. The participants' experience covered a diverse range of audits, and their seniority levels ranged from third-year accountant to supervisor. In this regard, the partner with whom we interacted was asked to elicit participation from as broad a cross-section of his audit colleagues as possible. We hoped in this way to maximize variation in audit expertise and thus to find evidence of this variation manifested in our performance metrics. On the other hand, because all participants were from the same office of the one firm, we hoped to reduce error variance that might arise from such factors as different organizational cultures, different approaches to audit training, and different approaches to the conduct of an audit. The firm was paid \$130 per participant as compensation for the substantial amount of time involved in conducting the experiment and to motivate participants to complete the experimental task conscientiously.

Measures of Ability and Knowledge

In this research we have used a model of expertise proposed by Shanteau (1987)² as a basis for measuring auditor ability and knowledge. Shanteau argues that experts possess the fourteen psychological characteristics shown in Table 1.³ These characteristics are neither mutually exclusive nor complete. Moreover, Shanteau (1987, p. 298) contends 'that not all kinds of experts possess the same characteristics'. 'Perceptual experts', such as livestock judges, will rely on sensory skills, whereas 'cognitive experts', such as auditors, will rely on problem-solving skills.

In our view, Shanteau's characteristics represent one possible, more detailed articulation of the ability and knowledge components in Libby and Luft's (1993)

¹ In all cases, participation was requested by a partner, but nonetheless it was made clear that it was voluntary.

² We are using the term 'model' fairly loosely. To the best of our knowledge, Shanteau has not carefully articulated the relationships among his expertise characteristics nor their interactive effects on performance.

³ Shanteau (1987, pp. 292–7) reviews prior research that supports the inclusion of each characteristic in his model of expertise. Abdolmohammadi and Shanteau (1992) found support for the inclusion of each characteristic when they asked practising auditors and accounting students to list the attributes they felt were important in an auditor. The characteristics also correspond closely to Glaser and Chi's (1988) list of characteristics of experts.

TABLE 1

SHANTEAU'S (1987) CHARACTERISTICS OF EXPERTISE

Characteristic	Explanation	Libby and Luft (1993)
1 Perceptual/attention	Can observe what others cannot	Ability
2 Relevant/irrelevant information	Can identify which information is important to focus on	Knowledge
3 Simplify complexities	Can make sense out of complexity	Ability
4 Communication skills	Can convince others of their expertise	Ability
5 Exceptions	Know when to break decision rules	Knowledge
6 Responsibility	Willingness to stand behind a decision	Ability
7 Selectivity	Know which problems to solve	Knowledge
8 Confidence	Believe in themselves and their abilities	Ability
9 Adaptability	Can change decision strategies	Knowledge
10 Content knowledge	Know a lot and stay current with their area	Knowledge
11 Automaticity	Do easily what others find hard	Knowledge
12 Stress tolerance	Work effectively under stress	Ability
13 Creativity	Ability to find novel solutions to problems	Ability
14 Inability to articulate	Cannot describe how they make decisions	Knowledge

model. In this regard, Table 1 shows our judgment as to how each characteristic should be classified. The nature of and importance of the relationship between many, if not all, of these characteristics and performance on different types of audit tasks, however, *ex ante* is unclear. In this light, our research is exploratory in nature.

Based on Shanteau's model of expertise, we used two instruments to measure auditor ability and knowledge. The first was designed to assess a participant's expertise in relation to evaluating the extent of dollar error that might exist in the inventories of a medium-sized manufacturing company. The fourteen items on the instrument were Shanteau's characteristics of expertise (Table 1). Participants were asked to rate themselves on a seven-point Likert scale ranging from 'very low' to 'very high', reflecting their beliefs in the extent to which they did not or did have the expertise characteristic relative to all other auditors they knew.

The second instrument asked participants to assess the importance of possessing each of Shanteau's fourteen characteristics of expertise in relation to the experimental task they were given. This task involved their estimating the dollar error in the inventories of a medium-sized manufacturing company. After they had finished the task, they completed the instrument. Participants rated the importance of having each characteristic on a seven-point Likert scale ranging from 'very low importance' to 'very high importance'.

Measures of Judgment Accuracy and Confidence

To measure judgment accuracy, we used an instrument developed by Weber (1978) to assess a participant's ability to estimate the dollar error that might exist

in four types of inventory—raw-materials inventory, work-in-process inventory, finished-goods inventory, and total inventory—for a medium-sized manufacturing company. Participants were first presented with a case description of the company and working papers describing the results of audit work conducted on the company's inventory system (see below). In light of the audit results, they were asked to prepare a frequency distribution for each of the four types of inventory of possible dollar error that might exist in the inventory.

When preparing the frequency distribution of possible dollar error, participants were asked to follow a particular procedure. First, they were requested to estimate the range of dollar error they thought could exist in each type of inventory. Next, they were asked to divide this range into five equal intervals and to assign a percentage to each interval representing the probability they would give to the true dollar error falling within this range. Their judgment accuracy was then assessed by calculating the absolute difference between the mean of their frequency distribution and the mean of the distribution of dollar error produced by a program that simulated the manufacturing company's inventory system (see below). The simulation was run for 5,000 iterations of nine-month periods to produce the 'true' distributions of dollar errors. Thus, for each participant we obtained four measures of judgment accuracy: one for each of the four types of inventory associated with the manufacturing company.

To measure judgment confidence, we designed an instrument to assess a participant's confidence in the accuracy of their judgment of dollar error in the inventories. For each type of inventory, they were asked to rate their confidence in the accuracy of their judgment using a ten-point Likert scale ranging from 'very low confidence' to 'very high confidence'. Note that our dependent measure of confidence is different from the notion of confidence that Shanteau deems to be a characteristic of expertise (see Table 1). The former is an outcome that depends on how well auditors assess they have performed a *specific* task. The latter manifests self-confidence in general—confidence in one's *overall* abilities. In this regard, Park *et al.* (1994, p. 77) have found that 'general feelings of self-confidence do not transfer to specific feelings-of-knowing in a . . . domain.'

Case-Study Description

The case study used in the research was developed initially by Burns (1971), based upon an actual audit conducted by one of the (then) Big Eight public accounting firms. With slight modifications, it also has been used by both Weber (1978) and Trotman (1985). It describes the inventory accounting and control system in a medium-sized manufacturing company engaged in machining and selling alloy cast-iron fittings. In particular, the case description focuses on four products in the company's full inventory line of over 2,000 pipe fittings. These products constitute material items in the company's inventory and are representative of the total product line.

The production systems, accounting systems and internal controls used by the company are typical of a medium-sized manufacturer. They cover the receipt of raw materials from vendors, safeguarding of raw materials, transfer of raw materials to

work in process, safeguarding of work-in-process inventories, production of finished goods, transfer of finished goods to inventory, and safeguarding of finished-goods inventory. All accounting systems are manual rather than computer-based. The company uses a standard cost system to price inventory and to maintain control over production. At year end, inventory is adjusted to the lower of standard cost or market.

In light of an interim audit conducted on the system, various internal control weaknesses have been identified. These weaknesses permit nine types of error to occur periodically:

1. Failure by receiving personnel to count raw materials obtained from vendors. Vendors sometimes understate shipments to avoid the expense of dealing with claims for defective raw materials.
2. Clerical errors in applying correct standard price to raw materials received.
3. Overstatement of production in Department I to obtain favourable variances.
4. Overstatement of production in Department II to obtain favourable variances.
5. Clerical errors in applying correct standard direct labour hours and burden rates to time tickets.
6. Clerical errors in applying correct standard direct labour rates to time tickets.
7. Clerical errors in applying correct standard cost to raw-materials requisitions processed.
8. Failure by weight-count operator to notice overstatements in finished goods.
9. Clerical errors in applying correct standard cost to production orders transferred to finished goods.

A significant part of the case-study materials is a program that simulates the operations of the inventory system's internal controls and accounting procedures (see Burns, 1971; Burns and Loebbecke, 1975). The program can be used to generate and to process transaction data with predefined error frequencies. The characteristics of the transaction data are known—for example, the total number of raw material requisitions, the average size of raw material amounts requisitioned, and the standard deviation of raw material amounts requisitioned. Similarly, error rates are assumed to be known, and the values chosen are used as parameters within the program.

Using Monte Carlo procedures, the program generates transactions for the first nine months of a financial year and seeds processing of these transactions with the nine types of errors listed above. As output, the program provides detailed listings of transactions as well as frequency distributions of dollar error for the costing of raw materials, work-in-process, finished goods, and total inventory associated with the four types of products.

The results provide a database that has been used to prepare a set of audit working papers. Besides describing the company, the inventory system and the conduct of the interim audit, the working papers report the results of attributes sampling plans that were used to identify error frequencies for the nine types of errors. The results of the preliminary evaluation of internal control are also provided

in the working papers. Thus the working papers provide a basis for drawing inferences about the frequency of errors in the transactions processed up to 30 September of the financial year. They also provide a basis for estimating the error in raw materials, work-in-process, finished goods, and total inventories.

Procedures

Our procedures were conducted in two phases. During the first phase, the fifty-six auditors in our first group of participants completed the first instrument designed to measure auditor ability and knowledge. Recall, this instrument asked them to rate the extent to which they believed they possessed each of Shanteau's fourteen characteristics of expertise. They were asked to rate these characteristics in relation to their ability to evaluate the extent of the dollar error that might exist in the inventories of medium-sized manufacturing companies.

During the second phase we conducted the experiment at the participants' workplace in a room that was free from noise and distraction.⁴ Each participant was run singly through the experiment by a research assistant who was blind to the propositions being tested.

At the start of the experiment,⁵ the research assistant provided the first instrument to the participant. The participant then rated the extent to which they believed they possessed each of Shanteau's fourteen characteristics in relation to their ability to evaluate the extent of the dollar error that might exist in the inventories of medium-sized manufacturing companies.

Next the participants were given the case-study materials to read. At the end of these materials were instructions that asked participants to provide frequency distributions for the dollar error they estimated existed in each of the four types of inventory and confidence ratings in relation to the accuracy of their estimates of the frequency distributions.

The research assistant left participants alone while they read the case-study materials and provided their estimates of the frequency distributions of dollar errors in the four types of inventory and their confidence ratings in the accuracy of these estimates. Periodically, participants were visited to determine whether they were experiencing any difficulties.

When participants had finished the above tasks, the research assistant removed the case-study materials and the completed instruments. Participants were then given the final instrument to complete. This instrument asked participants to assess

⁴ Because the two instruments designed to measure ability and knowledge had not been used before, we first asked a colleague who had worked for several years as a practising auditor to undertake the experiment. He reported the case-study materials and measurement instruments were clear, realistic, and did not need to be altered.

⁵ Before participants commenced the experiment, the research assistant handed them a consent form that provided an overview of the nature of the research. The consent form also indicated that participation in the research was voluntary, that the participant could cease the experiment at any time, that the results were confidential, and that the experiment would not be detrimental to their health. If the auditors were willing to proceed, they were asked to sign the consent form to indicate they were agreeable to participating voluntarily in the research.

the importance of having each of Shanteau's fourteen characteristics of expertise to the estimation task they had just completed.

During all phases of the experiment, participants were asked to work quickly, as though they were undertaking an audit assignment for a client. On average, the experiment took about four hours to complete. No auditors withdrew from the experiment, but four failed to complete all parts.

RESULTS

Our data analyses proceeded in three steps. First, we undertook preliminary analyses of the data to evaluate the construct validity and reliability of our instruments, whether our dependent measures were distributed normally, and whether certain variables were correlated. Second, we examined the relationships between the participants' assessment of their expertise according to Shanteau's characteristics and their judgment accuracy with respect to the dollar error in the four types of inventory. Third, we examined the relationships between the participants' assessment of their expertise according to Shanteau's characteristics and their confidence in the accuracy of their judgments with respect to the dollar error in the four types of inventory.

Preliminary Analyses

We commenced our preliminary analysis by undertaking an exploratory factor analysis of the data we obtained via the first instrument we had designed based on Shanteau's characteristics of expertise. Our objective was twofold. First, we hoped that two factors would emerge from our analysis: one that we could label 'ability' in light of the items that loaded on it; and another that we could label 'knowledge' in light of the items that loaded on it. Recall, Table 1 shows our predictions of how each of Shanteau's fourteen characteristics can be categorized as either an ability or a knowledge factor. If these two factors emerged from our analysis, we could then calculate factor scores that we could attempt to correlate with our performance measures.

Second, the factor analysis would provide us with information on the validity and reliability of our measures of ability and knowledge. To the extent no factors emerged from our analysis or the factors that emerged could not be interpreted, our measures would then have to be considered as problematical.

As a rule of thumb, the number of cases used in factor analysis should be at least five times the number of variables to be factor analyzed (McCroskey and Young, 1979). Otherwise, the factor structure obtained from the analysis may not be stable. Accordingly, the ratings obtained from the first group of fifty-six auditors were pooled with the ratings obtained from the second group of forty auditors. The factor analysis of the fourteen characteristics was undertaken, therefore, based on ratings provided by ninety-six auditors ($96 > 5 \times 14$).

The first solution obtained was an unrotated factor solution. To determine the number of factors that underlie a data set, McCroskey and Young (1979, p. 380) argue the unrotated factor structure should be examined initially. If all variables

AUDITOR EXPERTISE: ACCOUNT DOLLAR ERROR ESTIMATES

TABLE 2

FACTOR LOADINGS AND DESCRIPTIVE STATISTICS FOR FIRST INSTRUMENT USED TO MEASURE ABILITY AND KNOWLEDGE

Characteristic	Factor loading	Mean	SD	Skew	Kurtosis	Range ^a
1 Perceptual/attention	.876	4.729	1.310	-0.620	0.395	1-7
2 Relevant/irrelevant information	.920	4.885	1.264	-0.821	0.841	1-7
3 Simplify complexities	.884	4.823	1.214	-0.864	0.591	1-7
4 Communication skills	.840	4.729	1.227	-0.676	0.583	1-7
5 Exceptions	.880	4.365	1.315	-0.723	0.115	1-6
6 Responsibility	.887	4.344	1.321	-0.431	-0.163	1-7
7 Selectivity	.905	4.677	1.174	-0.842	1.093	1-7
8 Confidence	.870	4.917	1.287	-0.827	0.676	1-7
9 Adaptability	.892	4.705	1.245	-0.957	0.836	1-7
10 Content knowledge	.902	4.354	1.384	-0.629	-0.139	1-7
11 Automaticity	.903	4.688	1.292	-0.698	0.358	1-7
12 Stress tolerance	.888	4.740	1.259	-0.773	0.626	1-7
13 Creativity	.893	4.438	1.272	-0.832	0.217	1-6
14 Inability to articulate	.887	4.635	1.144	-0.697	0.362	1-7

^a Possible range is 1-7.

have their highest loadings on the first factor, 'the proper interpretation is that the variables form a single factor'.

Table 2 shows the loadings of the fourteen variables on the first factor in the unrotated solution. The results are striking. All variables loaded heavily on the first factor. The eigenvalue for the first factor was 10.95, whereas the eigenvalue for the second factor was .27. Moreover, the percentage of total variance explained by the first factor was 78.21 per cent, whereas the percentage of total variance explained by the second factor was 1.93 per cent. In light of these results, we expected the reliability of the questionnaire to be high. Indeed, Cronbach's alpha was .98.

Table 2 also shows the mean, standard deviation, skewness, kurtosis and range for each of the fourteen variables on the first questionnaire. The ratings are distributed reasonably across the full range of possible ratings. When the individual questionnaires were examined, however, it became clear that little variability existed in ratings across questions. In other words, the auditors tended to give themselves the same rating across all questions, although the rating itself might be high or low.

There were two major implications of these results. First, it was clearly impossible to differentiate between an ability factor and a knowledge factor using the data. Instead, the results suggest that the auditors were making their ratings based on a single underlying factor—presumably some type of overall expertise factor. Thus, the results support Shanteau's contention that his fourteen characteristics are properties of a construct called expertise. Second, the results also meant that analysis of the relationships between individual characteristics and dependent measures

TABLE 3

RANKINGS AND DESCRIPTIVE STATISTICS FOR SECOND INSTRUMENT USED TO MEASURE ABILITY AND KNOWLEDGE

Characteristic	Rank	Mean	SD	Skew	Kurtosis	Range ^a
1 Perceptual/attention	1	5.925	1.118	-0.966	0.359	3-7
2 Relevant/irrelevant information	3	5.725	1.109	-0.696	-0.067	3-7
3 Simplify complexities	1	5.925	1.118	-1.411	2.255	2-7
4 Communication skills	13	4.375	1.275	-0.206	-0.576	2-7
5 Exceptions	9	4.850	1.231	1.048	1.201	1-7
6 Responsibility	14	4.200	1.381	0.168	-0.684	2-7
7 Selectivity	10	4.700	1.265	-0.189	-0.881	2-7
8 Confidence	10	4.700	1.363	-0.306	-0.246	2-7
9 Adaptability	6	5.175	1.375	-0.978	1.042	1-7
10 Content knowledge	5	5.525	1.240	-0.671	0.071	2-7
11 Automaticity	3	5.725	1.109	-0.696	-0.067	3-7
12 Stress tolerance	8	4.875	1.181	-0.229	-0.313	2-7
13 Creativity	7	4.900	1.317	0.117	-1.039	3-7
14 Inability to articulate	10	4.700	1.344	-0.531	-0.384	2-7

^a Possible range is 1-7.

was pointless. Given the high multicollinearity among the characteristics, individual correlations could not be interpreted. The only way forward, therefore, was to calculate a single factor score for each auditor and determine whether it was correlated with the performance measures.

Table 3 shows the mean, standard deviation, skewness, kurtosis and range for each of the fourteen variables contained in the second questionnaire that we designed based on Shanteau's characteristics. It also shows the rank of each variable based upon their mean score. Note the participants have indicated they believe the 'cognitive' characteristics of expertise are most important to their performance on the case-study exercise. The top five are perceptual/attention, simplify complexities, relevant/irrelevant information, automaticity, and content knowledge.⁶ In our view, these results support the face validity of the task we assigned to the auditors.

We also evaluated the reliability of this questionnaire by calculating Cronbach's coefficient alpha. The result was .925, thus indicating that the questionnaire was reliable. The reliabilities for the individual items on the questionnaire were also high.

Table 4 shows the mean, standard deviation, skewness and kurtosis for the four accuracy measures and the four confidence measures. For the four accuracy measures, note the distributions are right skewed and peak higher than the normal distribution. Thus, the data was transformed using a logarithmic function (base 10)

⁶ With the exception of 'simplify complexities', the remaining four are in the top six 'cognitive' items rated most important by the partners and managers in Abdolmohammadi and Shanteau's (1992) study.

AUDITOR EXPERTISE: ACCOUNT DOLLAR ERROR ESTIMATES

TABLE 4
DESCRIPTIVE STATISTICS FOR DEPENDENT MEASURES

Variable	Untransformed				Transformed (Log 10)			
	Mean	SD	Skew	Kurtosis	Mean	SD	Skew	Kurtosis
Raw-materials accuracy	53,727	46,115	1.979	3.841	4.604	0.340	-0.092	0.198
Work-in-process accuracy	25,579	48,697	4.731	23.331	4.059	0.566	-0.162	0.173
Finished-goods accuracy	26,892	49,117	4.068	18.048	4.014	0.652	-0.341	0.137
Total accuracy	58,190	70,924	1.754	2.771	4.402	0.679	-0.887	1.178
Raw-materials confidence	4.256	2.233	-0.183	-1.301	0.543	0.309	-0.775	-0.855
Work-in-process confidence	3.523	1.993	0.277	-0.841	0.462	0.298	-0.477	-1.151
Finished-goods confidence	3.514	2.120	0.262	-1.060	0.446	0.320	-0.388	-1.378
Total confidence	3.265	1.959	0.286	-0.935	0.418	0.311	-0.308	-1.479

TABLE 5
CORRELATION COEFFICIENTS AND LEVELS OF SIGNIFICANCE
FOR DEPENDENT MEASURES

	Raw materials	Work-in-process	Finished goods
Accuracy Measures			
Work-in-process	-0.056 (.760)		
Finished goods	0.568 (.000)	0.203 (.266)	
Total inventories	0.592 (.000)	0.563 (.000)	0.684 (.000)
Confidence Measures			
Work-in-process	0.774 (.000)		
Finished goods	0.813 (.000)	0.886 (.000)	
Total inventories	0.731 (.000)	0.921 (.000)	0.831 (.000)

to try to restore normality. The distributions for the transformed data show the transformations were somewhat successful (Table 4). Thus, the transformed data was used in all subsequent analyses.

The distributions for the four confidence measures are also right skewed and more peaked than the normal distribution, although much less than the accuracy measures. Again, a logarithmic transformation (base 10) was applied to the data. The distributions for the transformed data, however, were no better than the distributions for the original data (Table 4). Because the violations of normality are not serious for the original data, it was retained for the subsequent analyses.

Table 5 shows the extent of the correlations among the four accuracy measures and among the four confidence measures. Note the existence of high correlation coefficients that are statistically significant among the variables in each of the two sets

of dependent measures. Thus, results for the individual accuracy and individual confidence measures cannot be considered independently of results for the other accuracy and confidence measures. Caution must be exercised, therefore, when interpreting the results presented below.

Accuracy Results

To determine whether the data manifested a relationship between the factor we labelled as 'expertise' and our measures of judgment accuracy, we first calculated an overall measure of expertise in relation to the experimental task that the participants had been given. Recall, the first questionnaire asked the participants to assess their expertise in terms of Shanteau's fourteen characteristics. The second questionnaire, on the other hand, asked the participants to assess how important each of the expertise characteristics was to the experimental tasks. We therefore calculated a *weighted* measure of expertise for each characteristic by multiplying the first rating by the second rating. This weighted measure reflects a combined evaluation of how expert the participants see themselves in terms of the characteristic and how important they then see the characteristic to the experimental task. Because the factor analytical results indicate the fourteen characteristics all manifest a common underlying factor, we then took the *average* of the fourteen weighted ratings to obtain a single, overall measure of expertise for each participant.

Having obtained this measure, we next correlated it with each of the four accuracy measures (logarithmically transformed) we had obtained for each participant. None of the Pearson correlation coefficients was significant: raw-materials accuracy ($r = -.03, p = .87$); work-in-process accuracy ($r = -.10, p = .55$), finished-goods accuracy ($r = .21, p = .21$); total inventories accuracy ($r = .02, p = .92$).

Our weighted average measure is perhaps the best measure of expertise in relation to the experimental task, but unfortunately its use mitigates against our finding a relationship between expertise and judgment accuracy. Because the weighted average measure is a product of two other measures, its variance will be greater than the variance of either of the measures from which it is calculated. Relative to a single, direct measure of expertise, therefore, we will require a more powerful test to detect any relationship that exists.

Accordingly, to test further whether a relationship existed between expertise and judgment accuracy, we next correlated the average score of each participant on the first questionnaire with the four accuracy measures we had obtained for each participant. Recall, the first questionnaire measures the participants' perceptions of their expertise, in general, in relation to the audit of inventories of a medium-sized manufacturing company. Again, none of the Pearson correlation coefficients was significant: raw-materials accuracy ($r = .09, p = .59$); work-in-process accuracy ($r = -.07, p = .66$); finished-goods accuracy ($r = .22, p = .19$); total inventories accuracy ($r = .07, p = .70$).⁷

⁷ We also calculated a measure of expertise based on the top five characteristics as indicated by the auditors' responses to the second instrument (Table 3). We calculated three measures based on the first instrument only, the second instrument only, and the weighted characteristics (the product of the ratings on the first and second instruments). Again, none was significantly correlated with the four accuracy measures.

Confidence Results

To determine whether our data manifested a relationship between our expertise measure and our measures of judgment confidence, we followed the same procedures we used with judgment accuracy. We first correlated the single, overall, weighted average measure of expertise for each participant with the four confidence measures we had obtained for each participant. None of our Pearson correlation coefficients was significant: raw-materials judgment confidence ($r = .15$, $p = .39$); work-in-process judgment confidence ($r = .22$, $p = .22$); finished-goods judgment confidence ($r = .26$, $p = .15$); total inventories judgment confidence ($r = .21$, $p = .24$).

Next we correlated the average score of each participant on the first questionnaire with the four confidence measures we had obtained for each participant. On this occasion, all Pearson correlation coefficients were highly significant: raw-materials judgment confidence ($r = .49$, $p = .004$); work-in-process judgment confidence ($r = .46$, $p = .007$); finished-goods judgment confidence ($r = .45$, $p = .008$); total inventories judgment confidence ($r = .47$, $p = .006$).⁸

We also examined whether the four confidence measures were correlated with the four accuracy measures. None of our Pearson correlation coefficients was significant: raw-materials ($r = .03$, $p = .863$); work-in-process ($r = -.15$, $p = .410$), finished-goods ($r = .35$, $p = .051$); total inventories ($r = .05$, $p = .802$).⁹ These results support those obtained by Kida (1980) and Pincus (1991), who also found no relationship between audit-judgment accuracy and confidence. Pincus (1991) argues that the absence of a significant relationship provides evidence in support of a process view of confidence. If this view is accepted, our results indicate that expert auditors are using a different threshold value to guide their evidence-gathering activities because they have a different level of confidence. The judgments, however, are no more accurate than non-expert auditors'.

LIMITATIONS

Aside from the usual threats to validity associated with experimental research, two specific sets of threats might have undermined our results. The first set relates to external validity. Specifically, the way in which the auditors who participated in our experiment were asked to complete the task was somewhat different from the way

⁸ Note, the first instrument to measure expertise contains an item (item 8) asking the auditors to rate themselves in terms of their belief in themselves and their abilities. This item is not the same as the dependent measure that asks auditors to rate their confidence in the accuracy of their judgments. Nonetheless, a measure of expertise was calculated with the confidence item excluded (the average of the other thirteen items on the first instrument). This measure was still significantly correlated with the judgment confidence measures: raw-materials ($r = .44$, $p = .012$); work-in-process ($r = .42$, $p = .017$), finished goods ($r = .41$, $p = .019$); total inventories ($r = .43$, $p = .015$).

⁹ We also examined whether the level of expertise was associated with the coefficient obtained by correlating accuracy with confidence for the four types of inventory. In other words, we thought that expert auditors might have better insight into the accuracy of their judgments as manifested in their confidence about their judgments. No significant relationship was obtained: expertise as measured by the first instrument ($r = .04$, $p = .802$); expertise as measured by the second instrument ($r = -.33$, $p = .054$); expertise as measured by the weighted average ($r = -.14$, $p = .392$).

they completed it in practice. When they performed the global evaluation task in practice, they were not required to estimate an explicit figure for a dollar error in the financial accounts using the procedures we had them follow. Implicitly they estimated the dollar error, but they did not have to make the types of specific judgments we elicited from them.

The partner with whom we interacted also advised us that his firm would not have followed the audit approach reflected in the case-study materials. The case study described a compliance-based audit approach, whereas he argued his firm would have followed a substantive-based approach. Furthermore, he pointed out that the case-study materials described a manual inventory system, and his staff most likely had encountered only computer-based inventory systems. After discussions with the partner and his manager, however, we nevertheless concluded that we still should proceed with the experiment. In our view, the task would still tease out important judgment processes that the auditors used in practice when they were making decisions on the dollar error in accounts.¹⁰

There is at least some evidence to suggest, however, that these threats to external validity are not serious. Specifically, even though the experimental task may have been somewhat different from the audit tasks our participants would have performed in practice, those who rated themselves more expert in the audit of manufacturing inventories still rated themselves more confident in the accuracy of their judgments. If the experimental tasks were markedly at odds with the tasks they performed in practice, presumably they would have been more circumspect about the confidence ratings they provided.

The second set of threats relates to construct validity. Specifically, at the outset of our research, we asked the partner with whom we interacted whether his firm would be willing to provide an expertise rating for the auditors who participated in the experiment. To reduce mono-operation and mono-method biases (Cook and Campbell, 1978), we were seeking to obtain multiple measures of expertise. After consultation with his colleagues, however, he indicated the firm was not prepared to provide such a rating. When we discussed our final results with him, we asked whether the firm would reconsider its position. We explained that our lack of results for accuracy may have occurred because our expertise measure lacked validity. If we could compare our measure with the firm's measure, we may gain insights into the validity of our measure. He once again consulted with his colleagues, and the firm agreed to provide ratings if they were subject to strict confidentiality controls.

Accordingly, we provided our expertise ratings to a third party (a statistician). The firm also provided its own ratings to this person. The ratings were associated only with a participant identification number. The third party then correlated the two sets of ratings and immediately destroyed both sets of ratings. He then provided us with the results. The correlation between the firm's ratings and our own ratings was almost zero. The third party explained that the correlation was negligible

¹⁰ Libby and Luft (1993, p. 428) point out that the 'experimentalist's comparative advantage lies in the ability to abstract fundamental components of real world settings and control other potentially influential variables'.

because there was little variation in the firm's ratings of the auditors whereas our ratings of the auditors contained considerable variation. The construct validity of our expertise measure, therefore, remains an open question.

IMPLICATIONS AND CONCLUSIONS

On the basis of our accuracy results, two competing arguments can be made. The first is that the results simply confirm prior psychological research which predicts that auditors will perform poorly when they must predict the dollar error in accounts based on the results of an internal control evaluation—the argument we canvassed at the outset. If this argument is accepted, research needs to be undertaken, therefore, to try to structure the task, to provide auditors with decision aids, and to devise methods of training and feedback that will assist them improve their performance on the task.

The second argument is that the accuracy results are still undermined by validity threats, such as those discussed in the previous section. We cannot disprove this argument, but we reiterate that we took several significant steps to mitigate the effects of validity threats—for example, use of a theoretically based measure of expertise, use of a realistic and substantive task, and use of an accuracy measure of performance. Nevertheless, if this argument is accepted, we believe the most significant threat is likely to arise from the lack of fit between the experimental task and the task performed in practice.

Our confidence results have some interesting and important implications. Pincus (1991, p. 39) points out that over-confidence can have deleterious consequences: auditors may (a) fail 'to search for additional evidence that would lead to different decisions', (b) ignore evidence that is contrary to their held position, and (c) be unresponsive to corrective feedback provided, for example, through decision aids or training. Audit management needs to be circumspect, therefore, about staff (or colleagues) who manifest high levels of self-confidence. They may be no more accurate in the work they undertake than staff (or colleagues) who are more reserved. Moreover, they may have attitudes that mitigate against improved decision making. Of course, self-confidence may be critical to superior performance in audit tasks other than the evaluation task we investigated.

Finally, our results indicate that it might prove difficult to distinguish between ability and knowledge factors when seeking to undertake tests of Libby and Luft's (1993) model. Auditors might not consider them to be separate, distinguishable factors. Instead, they might see them as highly correlated components of a single expertise construct. Future researchers will need to ensure, therefore, that the items they use to measure these two factors are unidimensional—that is, they load on only one of the factors and not both.

REFERENCES

- Abdolmohammadi, M. J., and J. Shanteau, 'Personal Attributes of Expert Auditors', *Organizational Behavior and Human Decision Processes*, November 1992.
- Abdolmohammadi, M. J., and A. Wright, 'An Examination of the Effects of Experience and Task Complexity on Audit Judgments', *The Accounting Review*, January 1987.

- Bédard, J., 'Expertise in Auditing: Myth or Reality?', *Accounting, Organizations and Society*, Vol. 14, Nos 1/2, 1989.
- , 'Expertise and its Relation to Audit Decision Quality', *Contemporary Accounting Research*, Fall 1991.
- Bédard, J., and M. T. H. Chi, 'Expertise in Auditing', *Auditing: A Journal of Practice and Theory*, Supplement, 1993.
- Biggs, S. F., and T. J. Mock, 'An Investigation of Auditor Decision Processes in the Evaluation of Internal Controls and Audit Scope Decisions', *Journal of Accounting Research*, Spring 1983.
- Biggs, S. F., and J. J. Wild, 'An Investigation of Auditor Judgment in Analytical Review', *The Accounting Review*, October 1985.
- Bonner, S. E., 'Experience Effects in Auditing: The Role of Task-Specific Knowledge', *The Accounting Review*, January 1990.
- , 'A Model of the Effects of Audit Task Complexity', *Accounting, Organizations and Society*, Vol. 19, No. 3, 1994.
- Bonner, S. E., and B. L. Lewis, 'Determinants of Auditor Expertise', *Journal of Accounting Research*, Supplement, 1990.
- Bonner, S. E., and N. Pennington, 'Cognitive Processes and Knowledge as Determinants of Auditor Expertise', *Journal of Accounting Literature*, Vol. 10, 1991.
- Burns, D. C., *Audit Evidence Evaluation Using Computer Simulation: With Special Emphasis on Ascertaining the Reliability of Accounting Data*, unpublished PhD dissertation, Indiana University, Bloomington, 1971.
- Burns, D. C., and J. L. Loebbecke, 'Internal Control Evaluation: How the Computer Can Help', *Journal of Accountancy*, August 1975.
- Colbert, J. L., 'The Effects of Experience on Auditors' Judgments', *Journal of Accounting Literature*, Vol. 8, 1989.
- Cook, T. D., and D. T. Campbell, *Quasi-Experimentation: Design and Analysis Issues for Field Settings*, Rand McNally College Publishing Company, 1979.
- Frederick, D. M., and R. Libby, 'Expertise and Auditors' Judgments of Conjunctive Events', *Journal of Accounting Research*, Autumn 1986.
- Glaser, R., and M. T. H. Chi, 'Overview', in M. T. H. Chi, R. Glaser and M. J. Farr (eds), *The Nature of Expertise*, Lawrence Erlbaum Associates, 1988.
- Kida, T., 'An Investigation into Auditors' Continuity and Related Qualification Judgments', *Journal of Accounting Research*, Autumn 1980.
- Kinney, W. R., Jr, and W. C. Uecker, 'Mitigating the Consequences of Anchoring in Auditing Judgments', *The Accounting Review*, January 1982.
- Libby, R., and D. M. Frederick, 'Experience and the Ability to Explain Audit Findings', *Journal of Accounting Research*, Autumn 1990.
- Libby, R., and J. Luft, 'Determinants of Judgment Performance in Accounting Settings: Ability, Knowledge, Motivation, and Environment', *Accounting, Organizations and Society*, Vol. 18, No. 5, 1993.
- Libby, R., and H.-T. Tan, 'Modeling the Determinants of Audit Expertise', *Accounting, Organizations and Society*, Vol. 19, No. 8, 1994.
- McCroskey, J. C., and T. J. Young, 'The Use and Abuse of Factor Analysis in Communication Research', *Human Communication Research*, Summer 1987.
- Park, C. W., D. L. Mothersbaugh and L. Feick, 'Consumer Knowledge Assessment', *Journal of Consumer Research*, June 1994.
- Pincus, K. V., 'Audit Judgment Confidence', *Behavioral Research in Accounting*, Vol. 3, 1991.
- Shanteau, J., 'Psychological Characteristics of Expert Decision Makers', in J. L. Mumpower, O. Renn, L. D. Phillips and V. R. R. Uppuluri (eds), *Expert Judgment and Expert Systems*, Springer-Verlag, 1987.
- , 'Competence in Experts: The Role of Task Characteristics', *Organizational Behavior and Human Decision Processes*, November 1992.

AUDITOR EXPERTISE: ACCOUNT DOLLAR ERROR ESTIMATES

- Shields, M. D., I. Solomon and W. S. Waller, 'Effects of Alternative Sample Space Representations on the Accuracy of Auditors' Uncertainty Judgments', *Accounting, Organizations and Society*, Vol. 12, 1987.
- Tomassini, L. A., I. Solomon, M. B. Romney and J. L. Krogstad, 'Calibration of Auditors' Probabilistic Judgments', *Organizational Behavior and Human Performance*, December 1982.
- Trotman, K. T., 'The Review Process and the Accuracy of Auditor Judgements', *Journal of Accounting Research*, Autumn 1985.
- Weber, R., 'Auditor Decision Making on Overall System Reliability: Accuracy, Consensus, and the Usefulness of a Simulation Decision Aid', *Journal of Accounting Research*, Autumn 1978.
- Wright, W. F., 'Audit Judgment Experience and Consensus', in K. R. Ferris (ed.), *Behavioral Accounting Research: A Critical Analysis*, Century VII Publishing Company, 1988.

Pacific Accounting Review

Joint Editors: Steven Cahan, Sonja Gallhofer and Jim Haslam

Published by Pacific Accounting Review Trust

Volume 9

June 1997

Number 1

CONTENTS

Editorial

A Generalised Method of Moments Test of Mean Variance Efficiency in the Australian Stock Market

R. W. Faff and S. Lau

Review of Pacific Accounting Review, 1988–96

S. Gallhofer, J. Haslam and S. Cahan

Compliance Costs of Corporate Income Taxation in Malaysia, 1995

A. Loh, M. Ariff, Z. Ismail, M. Shamsheer and M. Ali

A Note on The Expiration Day Price Effect in the Australian 90 Day Bank Accepted Bills Market

B. Oliver and M. Tahir

BOOK REVIEWS

International Accounting—A Global Perspective

M. Z. Iqbal, T. U. Melcher and A. A. Elmallah

Corporate Collapse—Regulatory, Accounting and Ethical Failure

F. L. Clarke, G. W. Dean and K. G. Oliver

RECENT JOURNALS AND MONOGRAPHS

FORUM

MISSION STATEMENT

INSTRUCTIONS TO AUTHORS



ABACUS has as its objective the publication of exploratory constructive and critical articles on all aspects of accounting and on those phases of the theory and administration of organizations and of economic behaviour generally which are related to accounting, finance and business studies.

Manuscripts should be sent to the Editor and will be considered for publication only if accompanied by a submission fee of U.S.\$40.00. The submission fee is waived if the author or a co-author is a personal subscriber to the journal. The general layout and style should follow the most recent Style Guide which is printed in the journal from time to time.

Editorial correspondence should be addressed to The Editor, ABACUS, c/ – Department of Accounting, University of Sydney, N.S.W. Australia 2006.

Style Guide to Contributors

1. Submit two copies of manuscript. After the paper has been accepted authors should supply papers as formatted text on disk. The disk copy will be used for printing. Any word processing format is acceptable. The hardware and the word processing package must be specified on the disk.
2. Use opaque quarto paper (207 mm × 260 mm) or A4 (210 mm × 297 mm); double space text; leave adequate (30 mm) margins on both sides.
3. Place name of author in BLOCK capitals above the title of the article. Give author's present position at the foot of the first page, as in this issue.
4. Use footnotes sparingly. Place them at the end of the manuscript, double spaced with an extra line between entries. Number footnotes consecutively throughout the text; use superior numbers without point, thus: '... money'.³ Cite books and articles in the text thus: ... (Jones, 1962, p. 21).
For page reference numbers use p. 21, pp. 423–32, pp. 406–571, but pp. 11–13, pp. 115–19.
5. List books and articles cited in alphabetical order at the end of the manuscript. When listing books and articles use the following forms respectively:
Jones, A., *Depreciation of Assets*, Publisher & Co., 1962.
Morrissey, L., 'Intangible Costs' in Morton Backer (ed.), *Modern Accounting Theory*, Prentice-Hall, 1966.
Revsine, L. and J. Weygandt, 'Accounting for Inflation: The Controversy', *Journal of Accountancy*, October 1974.
Smith, B., 'An Aspect of Depreciation', *The Journal of Accounting*, August 1965. Do not use brackets; use short titles for publishers unless it is essential to tracing.
6. Underline what is to be printed in italics. Use BLOCK capitals only for what is to be printed in capitals. Use italics and BLOCK capitals sparingly. Use the smallest number of styles for section headings; preferably side headings, in italics.
7. For quotations within the text use only single quotation marks, and double marks for quotes within quotes. Where quotations exceed four lines inset quoted material three spaces, but do not use quotation marks.
8. Do not use a point in standard abbreviations such as CPA, SEC, but use points in U.K., U.S.A., and similar abbreviations. Date style e.g. 19 February 1966.
9. Use double dashes (—) to indicate dashes in the text, single dashes (-) for hyphens.
10. Use 'z' for such words as capitalize; 's' for the smaller number of words such as advise, analyse, comprise, enterprise (see *Oxford English Dictionary*).
11. Use the simplest possible form for mathematical symbols.
12. Keep tables to a minimum, but do not try to convey too much information, at the cost of simplicity, in any one table.
13. For book reviews use the following form for headnotes:
A. JONES. *Depreciation*, Publisher & Co., London 1966, vii + 212 pp.

A BACUS

A Journal of Accounting, Finance
and Business Studies

CONTENTS

Editorial		i
FORUM ON DEPRIVAL VALUE ACCOUNTING		
A Modern Phoenix?	<i>G. W. Dean</i>	1
In Search of a Framework for Deprival Value and Other Purpose-Oriented Valuation Methods	<i>Richard Mattessich</i>	4
Deprival Value and Optimized Deprival Value in Australasian Public Sector Accounting	<i>Frank L. Clarke</i>	8
Deprival Value in the Netherlands	<i>Kees Camfferman</i>	18
Deprival Value and Price Change Accounting in the U.K.	<i>Geoffrey Whittington</i>	28
German Reflections on Asset Valuation	<i>Dieter Schneider</i>	31
Wanted: Foundations of Accounting Measurement	<i>R. J. Chambers</i>	36
The Influence of Regulation on the Publication of Consolidated Statements	<i>R. G. Walker and Janet Mack</i>	48
The Earnings Smoothing Potential of Systematic Depreciation	<i>John Hillier and Michael McCrae</i>	75
The Evolution of Standard Costing in the U.K. and U.S.	<i>Richard K. Fleischman and Thomas N. Tyson</i>	92
Auditor Expertise and the Estimation of Dollar Error in Accounts	<i>Pamela Kent and Ron Weber</i>	120



0001-3022(199903)13:1;1-7

ABACUS

A Journal of Accounting, Finance
and Business Studies

180198
180198

Commerce

CONTENTS

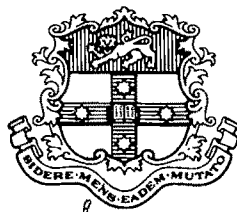
The FASB's Conceptual Framework and Political Support:
The Lesson From Employee Stock Options

Towards a General Model of the Reasons for
International Differences in Financial Reporting

Further Evidence on the Economic Effects of Changes in
Loan Loss Provisions on Bank Stock Returns

The Decision Relevance of Cash-Flow Information:
A Note

The Evolution of Bookkeeping in China:
Integrating Historical Trends With Western Influences



Published for the Accounting Foundation
University of Sydney
by
Blackwell Journals — Oxford and Cambridge, Ma.

EDITOR

G. W. Dean, University of Sydney

EDITORIAL BOARD

- | | |
|--|--|
| M. Abernathy, University of Melbourne | P. Luckett, University of New South Wales |
| M. Bradbury, University of Auckland | S. MacLeay, University of Bangor |
| P. Booth, University of Technology, Sydney | C. Nobes, University of Reading |
| P. Brown, University of Western Australia | R. R. Officer, University of Melbourne |
| R. J. Chambers (Editorial Consultant),
University of Sydney | R. Parker, University of Exeter |
| Chee Chow, San Diego State University | G. J. Previts, Case Western Reserve University |
| F. L. Clarke, University of Newcastle | M. Scorgie, La Trobe University |
| A. T. Craswell, University of Sydney | K. Someya, Waseda University |
| R. Edwards, University of Cardiff | A. Steele, University of Warwick |
| D. M. Emanuel, University of Auckland | D. Stokes, University of Technology, Sydney |
| J. Francis, University of Missouri | S. Taylor, University of Sydney |
| M. Gaffikin, University of Wollongong | K. Trotman, University of New South Wales |
| P. Griffin, University of California, Davis | A. Wagenhofer, University of Graz |
| S. Henderson, University of Adelaide | T. Walter, University of Sydney |
| D. Johnstone, University of Wollongong | G. P. Whittred, University of New South Wales |
| D. Jukes, KPMG, Sydney | P. Wolnizer, Deakin University |

ABACUS will be published three times in 1999 and the annual subscription price is: institutions A\$179, individuals A\$79 (Australia); institutions £115, individuals £50 (Europe); institutions U.S.\$213, individuals U.S.\$107 (North America); institutions £129, individuals £65 (rest of the world). Subscriptions include delivery from Australia by Economy Air. Canadian customers/residents please add 7% for GST. All subscriptions are supplied on a calendar year basis (January to December).

Business Correspondence All matters relating to orders and subscriptions and back orders should be addressed to Blackwell Publishers Journals, PO Box 805, 108 Cowley Road, Oxford OX4 1FH, United Kingdom. Fax: (44) 1865 381381 or by email: jnlinfo@blackwellpublishers.co.uk. Cheques should be made payable to Blackwell Publishers Limited. Back issues prior to Volume 26 can be obtained from The Editor, ABACUS, c/ - Department of Accounting, University of Sydney, N.S.W. Australia 2006.

INTERNET: For information on all Blackwell Publishers' books, journals and services log onto URL: <http://www.blackwellpublishers.co.uk>.

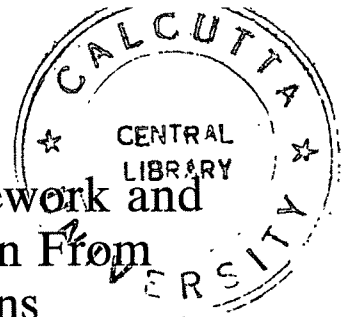
The journal is available on microfilm (16 or 35 mm) or 105 mm microfiche from the Serials Acquisitions Department, University Microfilms Inc., 300 North Zeeb Road, Ann Arbor, MI 48106, U.S.A.

COPYRIGHT: All rights reserved. Apart from fair dealing for the purposes of research or private study, or criticism or review, as permitted under the Copyright, Designs and Patents Act 1988, this publication may not be reproduced, stored or transmitted in any form or by any means without the prior permission in writing of the publisher, or in the case of reprographic reproduction in accordance with the terms of licences issued by the Copyright Licensing Agency, the Copyright Clearance Center and other organisations authorized by the Publisher to administer reprographic reproduction rights. Electrocopying of all or any part of this publication is not permitted without the prior permission in writing by the publisher.

© Accounting Foundation, University of Sydney.

HAIM A. MOZES

The FASB's Conceptual Framework and Political Support: The Lesson From Employee Stock Options



This article provides a detailed analysis of accounting for employee Stock Options (ESOs) in the U.S. to illustrate the limitations in conceptual frameworks of accounting that follow the FASB's model. While the FASB's Conceptual Framework of Accounting addresses measurement issues (e.g., historical cost versus current cost), asset definition issues (e.g., how to classify bond discounts) and liability and timing issues (e.g., how to treat executory contracts), it does not provide an accounting model or 'view' for a number of economic events. In cases where an alternative view exists and the conceptual framework has different timing and measurement implications for each of the views, the FASB's conceptual framework cannot be used to obtain regulators' political support for standard-setters' recommendations. Hence, there are a number of troublesome accounting issues, such as ESOs, for which the FASB risks ceding control of the standard-setting process to the SEC. A better model for conceptual frameworks might be one that contains specific definitions of economic events in terms of accounting elements and an explicit statement whether the attributes of relevance or reliability are of paramount concern.

Key words: Accounting; Concepts; Employee stock option plans; ESOP; FASB; Options; Pricing; SEC.

INTRODUCTION

The Financial Accounting Standard Board's (FASB) Conceptual Framework (CF) of Accounting project was completed in 1986 at a substantial cost after ten years of effort. Subsequent to the publication of the FASB's CF, the Australian Accounting Research Foundation, the International Accounting Standards Committee, the Canadian Institute of Chartered Accountants, the Accounting Standards Board (U.K) and the New Zealand Society of Accountants began work on their own conceptual frameworks. There are several hypothesized benefits from a CF of Accounting. Horngren (1981) and Dopuch and Sunder (1980) argue that a CF should increase standard-setters' ability to enact standards they feel are consistent with accounting theory. Solomons (1986) argues that a CF should be directed towards the establishment of sound *principles* for standard-setters to use in shaping

HAIM A. MOZES is Associate Professor of Accounting at Fordham University. The author would like to acknowledge the input provided by professors Robert Halperin and Georgia Saemann, and the helpful suggestions provided by the Editor.

accounting practice, and Milburn (1991), DePree (1989), and Chambers (1996) argue that a CF should provide a basis for standard-setters to deduce logical accounting recommendations. Mozes (1992) argues that a CF is useful for organizing and formulating normative accounting research and for defining the terms of debate with respect to various standard-setting proposals.

In the U.S. (as well as in other countries), private bodies have had the major role in providing authoritative guidance on the standards that seek to 'present fairly' the firm's financial position and that constitute 'generally accepted accounting principles'. Zeff (1995) explains that in the U.S. the 'generally accepted' clause has come to mean that the principle is acceptable to the FASB and the Securities and Exchange Commission (SEC), and this understanding was codified by the SEC's Accounting Series Release ASR 150 (SEC, 1973). In the majority of cases, the SEC followed the FASB's guidance. However, the FASB was forced to adopt reporting rules which they explicitly acknowledge to be imperfect in several politicized standard-setting issues.¹ For example, par. 5 of SFAS 87, *Employers' Accounting for Pensions* (FASB, 1985), states that the Board 'believes that those conclusions [i.e., SFAS 87] are not likely to be the final step . . . Pension accounting in 1985 is still in a transitional stage'. More recently, par. 61 of SFAS 123, *Accounting for Stock Based Compensation* (FASB, 1995), notes that the political debate over employee stock options (ESOs) became so divisive that it 'threatened the future of accounting standard-setting (par. 60)' and the preferred rules could not be adopted. Specifically, the Board maintained that

Financial reporting would be improved if all equity instruments granted to employees . . . were accounted for on a consistent basis (i.e., expensed). However, in December 1994, the Board decided that the extent of improvement that was envisioned . . . was not attainable because the deliberate, logical consideration of issues that usually leads to improvements in financial reporting was no longer present.

One question that arises is why the FASB has not been able to utilize its CF to obtain support from the SEC in controversies such as those surrounding ESOs. This article provides an in-depth analysis of accounting for ESOs. It illustrates two reasons why the FASB's CF could not deliver regulators' political support. First, there are alternative accounting models or 'views' for the transaction in which a firm grants ESOs to its employees. Each view generates different measurement and timing implications for accounting practice, yet each set of implications may be defended as being consistent with the CF. Second, the measurement and timing difficulties in the FASB's ESO proposal carried equal weight as the FASB's argument that their proposal would result in more relevant financial reporting, because the CF does not provide a mandate for standard-setters to emphasize relevance more heavily than reliability. Hence, there were, and there will continue to be, cases where the FASB's CF cannot generate support for standard-setting recommendations, even if the recommendations are logically consistent with the implications of

¹ Accounting researchers have long noted the political factors that shape financial reporting standards (e.g., Gerboth 1973, Solomons 1978, and Watts and Zimmerman 1978).

a given view (see DePree, 1989).² The basic feature of these cases is that there are alternative views for the event or transaction in question, the views have different measurement and timing implications, and the CF does not proscribe any one of the views. A second question that arises is what are the implications of the FASB not being able to provide a compelling justification for its recommendations. This article develops the argument that the FASB's inability to articulate convincing justifications for its proposals on controversial topics, due to the weakness of its CF, may result in the locus of standard-setting control shifting from the FASB to the SEC.

The primary conclusion of this article is that Conceptual Frameworks of Accounting that are modelled after the FASB's approach are unlikely to prove efficacious. If national (or international) accounting standard-setting bodies desire to develop or improve upon their conceptual frameworks, they would be advised to consider an alternative conceptual framework model. In this model, a conceptual framework would provide specific definitions of economic events in terms of accounting elements and an explicit statement whether the attributes of relevance or reliability are of paramount concern. By doing so, the conceptual framework may provide standard-setters with greater ability to develop logically consistent accounting standards and to effectively respond to politically motivated criticism of their proposed standards.

A number of previous studies analyse the usefulness of various CFs by examining whether they allow the logical derivation of accounting rules. As examples of studies analysing the FASB's CF, Dopuch and Sunder (1980) and Ketz and Kunitake (1988) examine whether the U.S. CF is useful for guiding accounting for deferred taxes, Dopuch and Sunder (1980) examine whether the U.S. CF provides useful guidance for oil and gas exploration costs and current value reporting, and Joyce *et al.* (1982) examine whether the CF's statements dealing with the required qualitative characteristics of accounting data are operational and lead to clear normative recommendations. As an example of a study analysing other conceptual frameworks, Gore (1995) analyses the usefulness of the British and Irish Conceptual Frameworks (Statements of Accounting Practice and Financial Reporting Standards) by examining whether they provide useful guidance for group accounting, deferred taxation, extraordinary items, inflation accounting, funds/cash flow statement, and research and development.³ Three features distinguish this article from previous research. First, previous research mainly critiques the CF's definition of

² Past examples other than ESOs include: (a) accounting for pensions, where the value of the firm's unfunded or overfunded pension obligation does not appear on the balance sheet as assets or liabilities; (b) accounting for marketable securities, where the change in the value of 'available-for-sale' marketable securities does not appear on the income statement; and (c) accounting for foreign subsidiaries, where the exchange-rate related change in the translated asset values of the subsidiary does not appear in the parent's income statement. A recent example is the FASB's proposal for accounting for derivatives, where the change in the value of derivatives that hedge future cash-flows would not appear on the income statement.

³ Dopuch and Sunder (1980), Joyce *et al.* (1982), Ketz and Kunitake (1988) and Chambers (1996) all criticize the FASB's CF and conclude that it is inadequate. Gore (1992, 1995) concludes that the British and Irish Conceptual Framework is modestly useful because it provides guidance on some, but not all, of the issues examined.

accounting elements by illustrating the continuing role of judgment on a case-by-case basis in operationalizing the CF's qualitative characteristics of accounting data. The implicit premise of these works is that improved definitions of accounting elements would remedy the CF. By contrast, the conclusion of this article is that CFs that consist only of definitions of accounting elements are inherently flawed. Second, this article relates the weakness of the CF exercise to a highly politicized context of standard-setting. Third, this article analyses the interplay between the weakness of the CF and regulators' role in the standard-setting process.

DESCRIPTION OF ESOS AND HISTORY OF ACCOUNTING FOR ESOS

ESOs are options to purchase the firm's stock, for a price usually equal to or close to the stock price on the options' grant date. The options generally extend for a period of between five and ten years, and the holder of the options has no voting rights and receives no dividends prior to exercising the options. There is usually a vesting period in which the employee cannot exercise the options, and if the employee leaves the firm prior to the end of the vesting period, the options are forfeited. In addition, employees cannot sell their ESOs, and if they leave the firm after the vesting date they must either immediately exercise or forfeit their ESOs. Because ESOs are non-transferable, employees wishing to reduce their risk from fluctuations in the firm's stock price may exercise their ESOs before the expiration date even if they remain with the firm.⁴ Hence, the length of time that ESOs will remain outstanding is unknown until the options are exercised.

In 1972, the AICPA issued Accounting Principles Board (APB) Opinion No. 25, *Accounting for Stock Issued to Employees*. As a result, virtually no option grant that is out-of-the-money on the grant date will ever be reflected on the income statement.⁵ An obvious shortcoming is that this approach ignores that an option to buy stock at a predetermined price during an extended period of time has economic value. In 1982, AcSEC, the AICPA's senior technical committee on accounting matters, submitted to the FASB a lengthy position paper arguing that the cost of employee stock options should be recognized as an expense. Notably, in the more specialized issues that the FASB often delegates to AcSEC, AcSEC's pronouncements are considered 'authoritative'. Responding to the perceived shortcoming in accounting for ESOs, in March 1984 the FASB added this to its agenda, and in May 1984 the FASB issued an Invitation to Comment to the public. A preliminary conclusion, voiced by the FASB in a Status Report dated 1 April 1987, was that the cost of an ESO should be measured as the 'Minimum Value'. With the minimum value method, the exercise price is first discounted from the option's expiration date back to the option's grant date using the riskless rate. Then, this

⁴ By contrast, the assumption for marketable options on stocks that do not pay dividends is that they will never be exercised prior to the expiration date (Merton 1990).

⁵ APB 25 requires the firm to calculate its compensation expense on ESOs as the option's intrinsic value (i.e., the stock price minus the exercise price) on the measurement date. Since the measurement date is almost always the date on which the ESOs are granted and the intrinsic value for an at-the-money grant is zero on that date, no expense is ever associated with the option grant.

figure is subtracted from the stock's market price on the grant date.⁶ However, in the third quarter of 1988, the FASB reconsidered its endorsement of the minimum value method, as respondents strongly opposed that method. An expressed concern was that applying this method would lead to a decrease in ESO grants (Poster, 1986). Another was that the non-transferability feature of ESOs is not adequately accounted for under this method (Beresford and Neary, 1986).

While the FASB continued its deliberations, in February 1992 the SEC asked its chief accountant to study accounting for ESOs and report on the need for any change. In October 1992, the SEC mandated new Proxy Statement disclosures (see Freher, 1992–3, for a description), and in June 1993 the FASB issued an Exposure Draft (ED) on accounting for stock-based compensation that would have required income statement recognition for the cost of ESOs. Given the length of time the FASB had devoted to the stock-based compensation project, the project's very public nature and the SEC's interest in the matter, it is difficult to imagine that the FASB did not receive private expressions of support from the SEC prior to issuing the 1993 ED. In fact, Freher (1992–3) states that the SEC's desire that ESOs should be expensed was one of the primary reasons that the stock option project remained on the FASB's agenda after its 1988 retraction of the minimum value recommendation.

Firms whose earnings would be most affected by the 1993 ED's proposal, namely start-up and high-technology firms, mobilized opposition to the ED.⁷ The Board received 1,786 comment letters on the ED, with the vast majority opposed to any form of recognition for ESOs (SFAS 123, par. 376). In opposition to the ED, Senator Joseph Lieberman introduced in July 1993 the Equity Expansion Act of 1993, which directs the SEC not to require ESO grants to be recognized as expenses, regardless of FASB pronouncements. In late 1993, AcSEC issued a comment letter to the FASB opposing the ED and recommending that the cost of ESOs be disclosed in the footnotes but not recognized on the income statement. More ominously for the FASB, the Accounting Standards Reform Act of 1994 was introduced in Congress. This act proposed to amend federal securities law by mandating that the SEC explicitly ratify all new accounting standards. The SEC monitored the process surrounding the ED and privately communicated with FASB staff, but did not issue any formal opinion of the ED (SEC Chairman Levitt, 1995). The lack of a publicly stated opinion on the ED is consistent with SEC actions in other controversial cases. Burton (1982, p. 46) explains how the SEC's statutory authority prevents it from expressing official opinions in response to FASB proposals. However, at the SEC–FASB open meeting of 17 November 1993,

⁶ If the firm pays dividends, the present value of the dividends expected to be paid from the grant date through the expiration date is subtracted from the minimum value. Noreen (1979) suggests that the minimum value is the firm's net cost to acquire treasury stock and hedge the ESOs. The stock's market price on the grant date represents the cost to acquire the stock and the discounted exercise price represents the firm's proceeds from the options' exercise. Whether or not the employee eventually exercises the ESOs, the firm will have only lost the time value of money represented by the minimum value.

⁷ Foster *et al.* (1991, 1993) provide evidence on how various methods of calculating the firm's ESO cost would reduce earnings.

Commissioner J. Carter Reese expressed strong concerns about the ED's direction and its potential effects on capital formation. These comments received wide publicity in a *Wall Street Journal* column (p. 18) dated 8 February 1994.⁸

Apparently in response to political opposition, the Board withdrew its 1993 ED in December 1994. The SEC then took the very unusual step of filing a Letter of Comment with the FASB in support of the FASB's decision to withdraw the ED. The SEC letter of comment (letter no. 121), dated 3 April 1995, states:

The Commission has followed with great interest the FASB's project in accounting for stock-based compensation. We congratulate the Board for arriving at a balanced solution to the policy issues raised during the course of the project after a careful deliberative process in which the views of all interested parties were considered. We concur in the Board's decision that the time has come to end the debate on this project . . . The Commission understands that the Board's tentative conclusions on this project are as follows . . . In closing, the Commission believes that the FASB wisely has recognized that the interests of both providers and users will be served most effectively by concluding the stock-option debate. The Commission is fully supportive of your continuing efforts to issue a final Statement in the relatively near future.

The letter of comment is noteworthy for three reasons. First, it appears designed to support publicly the FASB's standard-setting role. Second, it absolves the SEC from any role in the decade-long process in which accounting for stock options was debated. Third, by spelling out its understanding of the final standard to be eventually issued, the SEC provided an implicit endorsement and recommendation for the FASB's final standard.

In December 1995, the FASB issued Statement of Financial Accounting Standards No. 123, *Accounting for Stock Based Compensation* (FASB, 1995). SFAS 123 requires firms to provide supplementary disclosure in which the compensation cost associated with ESOs is reflected in pro-forma income statements and recommends, but does not require, that firms actually recognize this compensation cost in the income statement. This standard is completely consistent with the 'understanding' in the SEC Letter of Comment to the FASB.

Computing the compensation cost associated with ESOs is complicated because employees are likely to exercise their ESOs before the ESO expiration date due to their difficulty in hedging their ESOs (see Lambert *et al.*, 1991, Huddart, 1994, Kulatilaka and Marcus, 1994, and Hemmer *et al.*, 1994).⁹ In fact, Huddart and Lang (1996) and Hemmer *et al.* (1996) provide evidence that executives holding options with a term of ten years will, on average, exercise the options after five or six years. Using the assumption that employees do not hedge their ESOs, Mozes (1995), Huddart (1994) and Kulatilaka and Marcus (1994) illustrate that the firm's cost of

⁸ The SEC governing board consists of five commissioners and a chairman.

⁹ There are two reasons why employees are unlikely to hedge their ESOs. First, the ESOs may represent a large proportion of employees' wealth, and they may not have sufficient additional wealth to hedge the options. Second, execution of a hedging strategy requires employees to sell the underlying stock short, and such action may conflict with insider trading restrictions. These issues do not arise with transferable options, as long as there exists at least one investor with the ability to hedge the options and earn risk-free arbitrage profits.

an ESO with a contract life of t years may be significantly less than the benchmark Black-Scholes value for an option with a term of t years, because employees' expected holding period will be considerably shorter than the ESO term.¹⁰

SFAS 123 deals with the early exercise issue by requiring the compensation cost of ESOs to be computed using employees' expected holding period rather than the contract period of the ESOs. This assumed holding period is then input into standard options pricing models such as the Black-Scholes or Binomial options pricing model (OPCOST).¹¹ Among the allowable assumptions in SFAS 123 for employees' expected holding period are that employees will exercise their ESOs: (a) when the stock price reaches a specified multiple of the exercise price, (b) when the stock's volatility reaches a specified level, and (c) when the stock price has increased by a certain percentage within a given period of time. SFAS 123 also requires firms to calculate the number of ESOs granted in which employees are expected to vest (NVEST). The ESO cost is simply OPCOST multiplied by NVEST. Then, the grant date value of the ESOs is prorated to compensation expense over the period between the grant and vesting dates. Subsequent (to the grant date) changes in the stock price and in estimates of employees' expected holding period do not affect the computation of compensation cost. However, changes in NVEST will affect compensation cost. If ESOs are recognized in financial statements, as recommended by SFAS 123, each period between the grant and vesting dates will require the same debit to compensation expense and credit to paid in capital—ESOs (unless there is a change in NVEST).

As an example of the recommended accounting for ESOs in SFAS 123, assume that the firm grants 1,100 ESOs, the value of one ESO on the grant date is \$20, the vesting period is four years, and employees are expected to vest in 1,000 ESOs. Each year between the grant and vesting dates, the firm would debit \$5,000 ($1,000 \times 20 \times 1/4$) of labour services and credit \$5,000 of equity.¹²

¹⁰ Huddart (1994) and Kulatilaka and Marcus (1994) show that the greater the employee's risk aversion the lower the firm's ESO cost, and the greater the employee's wealth the greater the firm's ESO cost, because more risk-averse (wealthy) employees will hold their ESOs for a shorter (longer) period of time. Mozes (1995) provides an upper bound for the firm's cost of ESOs that is independent of employees' risk aversion. He shows that for firms with high unsystematic risk relative to systematic risk, such as small high-tech firms, the *minimum* overstatement in using the Black-Scholes benchmark to determine the firm's ESO cost often exceeds 50 per cent.

¹¹ Empirical support for applying Black-Scholes options valuation techniques to long-lived options is provided by Noreen and Wolfson (1981). They find that market prices of publicly traded warrants are approximated by the Black-Scholes model.

¹² In most cases, the labour cost would be immediately expensed. However, the cost would be capitalized if the firm could identify that the labour was for the construction of long-term assets.

The cost of nonqualified stock options (NQOs) is deductible by the firm when the employee exercises the ESOs. However, the cost of incentive stock options (ISOs) is not deductible by the firm unless the options are disqualified by the employee. For NQOs, a deferred tax benefit is recognized each period, since the compensation expense that is recognized for financial accounting purposes is not yet deductible for tax purposes. Hence, if the corporate tax rate is 30 per cent, each year the firm would recognize a deferred tax benefit of \$1,500 ($\$5,000 \times .3$) and a corresponding decrease in tax expense of \$1,500. Any difference between the tax benefits actually realized from employees' exercise of the ESOs and the cumulative amount recognized on the balance sheet as a deferred tax benefit would be a direct adjustment to shareholders' equity.

POSSIBLE VIEWS OF THE ESO TRANSACTION

Accounting standard-setting requires a model that represents the economic event in question in terms of accounting elements. This analysis refers to such a model as a *view*. The bulk of the FASB's CF describes objectives of financial reporting and qualitative qualities of accounting data; defines the elements of financial statements such as assets, liabilities and equities; provides recognition criteria; and discusses concepts of income. At the very end of the CF, pars 229–254 of *Concepts No. 6* provide views of several transactions and events including instalment sales, discounted debt issues, differences between accounting and taxable income, investment tax credits, and certain costs incurred to procure future benefits. The objective of these examples is 'to emphasize concepts and sound analysis and to foster careful terminology, classification and disclosure (par. 229)'.¹³ However, in par. 255, the Board states that 'the examples in paragraphs 232–254 are intended to illustrate the definitions and related concepts, not to establish standards for accounting practice (par. 230)'. Furthermore, par. 229 suggests that the examples were deliberately selected precisely because they were trivial in that 'they appear to make little difference to practice'.

Since the CF does not provide a view for many transactions and events, *standards* that are subsequently adopted provide a model for representing the transaction or event in question in terms of the CF's accounting elements. The problem arises when there are a number of plausible views for a particular event or transaction. Each view may generate different measurement and timing implications, yet each set of implications can be defended as being consistent with the CF. In these cases, the FASB's support for the 'correct' view must be obtained and justified exogenously to their CF, and regulators cannot defend a particular recommendation as being mandated by the CF. An example of such a case is accounting for ESOs. This section analyses several views of ESO grants, corresponding to those considered in the 1993 ED and in the discussion of alternatives in SFAS 123. The selection of an ESO view is crucial because each of the three plausible views generates different measurement and timing implications.

Liability View

The firm pays employees a receivable as payment for their labour services. The receivable is the difference between the option's exercise price and the stock's market price, and the receivable fluctuates in value based on ensuing stock price movements. The basic issue in the liability view is whether ESOs can be recognized as liabilities under the CF.

Statement of Financial Accounting Concepts No. 6, *Elements of Financial Statements* (FASB, 1985) defines a liability to be 'probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or

¹³ Consistent with the usage in this article, the term 'view' is used several times in par. 240 to denote an accounting model that represents the economic event in terms of accounting elements.

events (par. 35).¹⁴ According to this definition of a liability, the firm's future opportunity cost, which represents a legal obligation to dilute the value of a share of its common stock and to transfer equity value from existing shareholders to ESO holders, cannot be considered a *liability*. Stock that is not outstanding is not an asset of the firm, so the firm does not transfer any assets when it sells stock to its employees at a below-market price. Therefore, the firm's obligation to sell stock at a below-market price does not represent a liability.¹⁵

Hence, if the liability view provides the accounting model for ESOs, no expense would be recognized until the ESOs are exercised because there cannot be any corresponding credit to a liability. The remaining question would be how to account for the exercise transaction. Compensation expense would normally arise when the firm sells stock at a below market price *in exchange* for labour services. According to SFAC 6, an expense is an 'outflow or other using up of assets or incurrence of liabilities . . . that have occurred or will eventuate as a result of central operations (pars 80–81)'. Selling stock for less than market value arguably represents an 'outflow or using up of assets'. However, in the case of ESOs the labour services are provided in the *entire* period between the grant and exercise dates. Recognizing compensation expense during the exercise period would distort the intertemporal allocation of income by creating a mismatch between the exercise period's revenues and expenses. For example, with a ten year option that is not exercised until the expiration date, recognizing an expense in year 10 would compress ten years' expense into one year.

As a result, the accounting model represented by the liability view would treat the exercise transaction as a sale of stock for the exercise price, with a debit to cash and a credit to capital stock for an amount equal to the exercise price. Alternatively, cash would be debited for the exercise price, capital stock would be credited for the market value of the stock, and a contra-equity account (i.e., discount on paid-in-capital) or retained earnings would be debited for the difference between the market and exercise prices. However, the contra-equity or retained earnings entry would not affect income.

Advance View

The firm grants equity to its employees in the form of ESOs in exchange for employees' future labour service, and the ESOs that are issued represent an advance

¹⁴ The definition of 'other entities' is given in SFAC 6 (par. 24) as: 'employees, suppliers, customers or beneficiaries, lenders, stockholders, donors, and governments are all *other entities* to a particular entity' (emphasis added).

¹⁵ Stock appreciation rights (SARs) are similar to ESOs except that, in most cases, employees can demand an amount of cash equal to the difference between the option's exercise price and the stock's market price on the date the options are exercised. SFAS 123 requires that SARs be recognized as compensation expense and liabilities if payment in cash is required at the employee's discretion. Balsam (1994) criticizes the distinction between ESOs and SARs and argues that ESOs should also be treated as liabilities. However, unlike ESOs, SARs are liabilities under the CF because the firm's obligation is to transfer cash to ESO holders. While the firm can, in theory, issue stock to obtain the cash to pay the SAR obligation, the firm can also do so with other monetary liabilities such as bonds or notes payable.

payment for services to be rendered. As collateral for employees' performance of their employment obligations, the firm retains the right to cancel the ESOs if employees leave the firm prior to the vesting date.

The amount the firm realizes from the ESO grant is the value of the labour services to be provided by employees. According to the advance view, this value is the market value of the ESOs on the grant date, because that is the amount employees *receive* for their labour services when they contract with the firm. Hence, the amount the firm receives from issuing the options is established on the grant date and subsequent changes in the stock price do not affect that amount. As a result, all ESOs granted would be valued on the grant date. This argument is similar to that in Robbins (1988).

However, employees are not legally obligated to perform any future services for the firm when they receive ESOs. In the event that employees do not perform any future services, they forfeit their ESOs but they are not required to compensate the firm with any assets or services. While the options are likely to entice employees to remain with the firm until the vesting date if the market price exceeds the exercise price, that incentive does not qualify as an asset for the firm. Since the firm does not receive any net assets on the grant date in exchange for the ESOs, the firm cannot possibly have increased shareholders' equity on the grant date.¹⁶ Hence, one could not rely on the advance view to recognize a prepaid compensation asset and an increase in equity on the grant date.¹⁷ Rather, the appropriate accounting treatment would be to debit compensation expense and credit equity each period between the grant and vesting dates. Because the advance view maintains that the options are received by employees on the grant date, all the ESOs would be valued on the grant date, and an equal amount of compensation expense and equity issuance would be recognized each period between the grant and vesting dates. This corresponds to the valuation method required by SFAS 123.

Executory View

When granting ESOs, the firm legally commits to provide ESOs (equity) to its employees at the vesting date if the employees perform specific labour services between the grant and vesting dates.

The accounting model represented by this view is that ESO grants are executory contracts. An executory contract specifies the goods or services to be provided by the outside party and the compensation to be provided by the firm. As with other executory contracts, the firm's obligation to issue ESOs can only be recognized

¹⁶ A analogous situation exists when investors subscribe to acquire stock, but have not yet paid for the stock. Because investors have no enforceable obligation to pay the balance of the subscription amount, the SEC does not allow firms to report the subscriptions receivable as an asset. Rather, the firm must show them as a contra-equity account. The net effect is that when investors subscribe to acquire the firm's stock, the firm does not report any increase in either assets or equity until the investors actually pay for the stock.

¹⁷ Interestingly, the 1993 ED recommended that equity and prepaid compensation cost (equal to the value of the ESOs on the grant date) should be recognized on the grant date, and that the prepaid compensation asset should be amortized to compensation expense over time.

when the employees actually provide labour services. The reason is that U.S. GAAP does not allow the firm to recognize the portion of executory contracts for which performance has not yet occurred.¹⁸

According to this logic, no transaction occurs on the grant date. Because employees are free to leave the firm and contract with another firm if the stock price drops prior to the vesting date, employees can, in effect, reset the exercise price on their ESOs prior to the vesting date and avoid the negative outcomes associated with a decline in the value of the underlying stock. Furthermore, employees may attribute a higher future value to their ESOs because they believe that their efforts will increase the firm's future stock price. This seems plausible, given that ESOs are often exchanged for incentive purposes. Hence, the grant date value of the ESOs does not represent the value that employees *expect to receive in the future* for their labour services. Since there is no evidence on the grant date of the value employees attach to their labour services, the only logical date to value the ESOs using the executory view would be the vesting date, when the ESOs are *received* by employees.

Under the executory view, the treatment of partial performance during the vesting period would be analogous to the treatment of defined benefit pension plans with cliff vesting. In cases with cliff vesting, the employee either vests in all the pension benefits or in none of the pension benefits. Paragraph 42 of SFAS 87, *Employers Accounting for Pensions*, requires that every year during the pension vesting period the firm must recognize as pension expense an amount equal to the pro-rated pension benefits earned during the year, despite the fact that the employee receives zero benefits if he departs prior to the vesting date. Similarly, the fact that employees do not vest in any ESOs prior to the vesting date should not preclude accounting recognition of compensation expense prior to the vesting date. After partial performance, employees have a receivable representing a pro-rated number of ESOs and the firm has an obligation to issue a pro-rated number of ESOs.

Hence, the executory view would lead to the conclusion that the compensation expense and equity issuance that are recognized each period in the interval between the grant and vesting dates should be based on the expected vesting date value of the ESOs and on the number of ESOs in which employees are expected to vest. As a result, periodic compensation expense would differ every period between the grant and vesting dates, as estimates of the vesting date value of the ESOs are revised.¹⁹ Consider the options which have a three year vesting period, where employees are expected to vest in all options, and the options' value is \$150 after the first year, \$300 after the second year and \$230 at the vesting date. The ESO expense recognized would be \$50 for the first year ($1/3 \times \$150$), \$150 for the second year ($2/3 \times \$300 - \$50$), and \$30 for the third year ($\$230 - \$150 - \$50$).

¹⁸ Operating leases and take-or-pay contracts are examples of executory contracts that are not recognized in financial accounting.

¹⁹ The FASB's terminology and reasoning in its final standard is somewhat confusing. Although SFAS 123 requires the accounting method implied by the advance view, par. 95 of SFAS 123 actually refers to ESO grants as executory contracts.

Each of the three models is deficient. The error of modelling ESO grants as liabilities of the firm (the liability view) is that an obligation based on equity values is more commonly modelled as an equity instrument. The error of modelling ESO grants as advances to employees (the advance view) is that: (a) the firm has the right to cancel the ESOs if employees leave the firm prior to the vesting date, and (b) employees have the right to leave the firm before the vesting date. These rights make it problematic to model ESO grants as an exchange on the grant date between the firm and its employees. The error of modelling ESO grants as executory contracts (the executory view) is that most executory contracts obligate both parties to perform their contractual obligations. However, ESO grants are unilateral contracts that are binding on the firm but not on employees.

In summary, there are three basic timing and measurement issues in accounting for ESOs. First, should the ESOs be measured on the grant date or on the vesting date? The advance view implies grant date valuation, the executory view implies vesting date valuation and the liability view implies exercise date valuation. Second, should the ESO valuation be based on a suitably modified option pricing model or on the options' intrinsic value (stock price minus grant price)? The advance and executory views imply the use of options pricing models, but the liability view implies the use of intrinsic value. Third, if options pricing models are to be used for ESOs, how should the ESO valuation be affected by the early exercise problem? While each of the three ESO views has different measurement and timing implications for financial accounting, none of the views is compelling or mandated by the FASB's CF. The analysis of the three ESO views can be generalized to suggest that the Board should have crafted the CF to provide views for as many relevant transactions as possible. While the Board's decision not to provide views in its CF reduced the controversy surrounding the CF, it also limited the CF's usefulness in providing solutions to politicized standard-setting problems.

THE ROLES OF RELEVANCE AND RELIABILITY IN ACCOUNTING FOR ESOs

Despite the lack of an ESO view in its CF, the FASB could possibly have obtained regulators' backing for the 1993 ED by arguing that its proposal provides more relevant and comparable data to users of financial statements than provided under APB 25. This section develops the argument that, even if one accepts the assumption that the data required to be reported by the 1993 ED is more relevant than the data required to be reported by other ESO reporting rules, a second flaw in the FASB's CF prevented it from using the relevance argument to support the 1993 ED. Specifically, the FASB's CF provides little guidance for dealing with conflicts between the qualitative data characteristics of relevance, comparability, and reliability.

According to Statement of Financial Accounting Concepts No. 2, *Qualitative Characteristics of Accounting Information* (FASB, 1980), reliability is based on

verifiability and representational faithfulness. One requirement of verifiability is that: 'Verifiable financial accounting information provides results that would be substantially duplicated by independent measurers using the same measurement methods (par. 82)'. Similarly: 'Verifiability implies consensus. Verifiability can be measured by looking at the dispersion of a number of independent measurements of some particular phenomenon. The more closely the measurements are likely to be clustered together, the greater the verifiability of the number used as a measure of the phenomenon (par. 84).' Given the latitude firms have in dealing with the early exercise problem (i.e., the measurement problems) and the question of when ESO costs should be determined (i.e., the timing problems), there is a question concerning the reliability of ESO costs.

The FASB attempted to minimize the issue of reliability with respect to the timing and measurement problems by arguing that its proposal (a) results in the most relevant information set being reported, and (b) improves users' ability to make cross-sectional comparisons with accounting data. SFAS 123 states that: 'The Board continues to believe [*sic*] that financial statements would be more *relevant* if the estimated fair value of employee stock options was included in determining an entity's net income, just as all other forms of compensation are included (par. 61)'. In addition, SFAS 123 states that ESO recognition would improve the comparability of financial statements because

Some entities use fixed stock options more extensively than other enterprises do, and reported operating expenses thus are understated to different degrees. Comparisons between entities of profit margins, rates of return, income from operation, etc. are impaired to the extent that entities continue to account for their stock-based employee compensation according to the provisions of APB 25 (pars 97–98).²⁰

Further, SFAS 123 explicitly states that the FASB emphasizes comparability more than reliability in the debate about accounting for ESOs. 'Increasing the comparability of financial statements is a worthy goal, even if all entities use a method that is less precise than the Board or its constituents might prefer (par. 39).'

Another approach taken by SFAS 123 to the issue of reliability is the argument that no reliability problem exists because *any* value for ESOs is more reliable than a value of zero:

All estimates, because they are estimates are imprecise. Few accrual-based accounting measurements can claim absolute reliability, but most parties agree that financial statement recognition of estimated amounts that are approximately right are preferable to the alternative—recognizing nothing—which is what Opinion 25 accounting recognizes for most employee stock options. Zero is not within the range of reasonable estimates of the value of employee stock options . . . (par. 111).

²⁰ Under the reporting that follows from the executory view, the compensation expense in the interval between the grant and vesting dates will change from period to period, as the current value of the ESOs changes. The resulting volatility in compensation expense may harm the time-series and cross-sectional comparability of income and compensation expense. As a result, the comparability argument in favour of ESO recognition applies more readily to the implications of the advance view than to the implications of the executory view. It is arguable that this line of reasoning led the FASB to adopt the advance view.

SFAS 123's primary line of argument, emphasizing comparability and relevance benefits, is not compelling because it attempts to justify minimizing a primary attribute (reliability) for the benefit of another primary attribute (relevance) and a secondary attribute (comparability). Specifically, SFAC 2 presents a hierarchy of accounting qualities. Reliability and relevance are both a 'primary decision-specific quality', while comparability is a 'secondary and interactive quality'. The argument that no reliability issue exists is easily countered simply because the fact that a number is more plausible than zero does not make that number inherently reliable. Though estimates are routinely used in pensions, allowance for uncollectibles, depreciation, deferred taxes, etc.,²¹ those estimates will eventually be 'trued up' and poor estimates will only distort the intertemporal allocation of income. With ESO estimates, the equity value that is initially provided will never be 'trued up' to reflect employees' actual holding periods. As a result, poor estimates of employees' actual holding periods will permanently distort financial statements.

Due to the inconclusiveness of its arguments, the FASB did not successfully demonstrate that the objectives of financial accounting, *as agreed upon in its CF*, are best served by recognizing ESOs. Had its CF explicitly stated that relevance is the more important attribute and should be given precedence in a conflict between relevance and reliability, the FASB might have obtained political support from regulators for their focus on the benefits of the increased relevance in financial accounting from ESO recognition. Instead, SFAC 2 defends its approach to preferability questions by stating that 'The basis for those decisions should be better understood if they can be seen to be aimed at obtaining an optimal mix (as judged by the Board) of certainly defined informational characteristics (par. 157)'. However, statements that a certain trade-off is or is not optimal can never be shown to be true or false because they are opinions rather than facts. Moreover, the CF's notion that there is an appropriate trade-off between relevance and reliability is logically inconsistent. As Chambers (1996) argues, trading off relevance and reliability results in financial statements that are neither relevant nor reliable.

Hence, it is not surprising that the FASB's ESO proposal was not accepted or regarded as compelling by affected parties, and that the FASB failed to obtain the SEC's political support for recognizing ESOs. Basically, the FASB's CF calls for the Board's judgement in cases where plausible alternatives exist (i.e., 'as judged by the Board'). However, standard setters' personal preferences are not compelling arguments for regulators' support. Quite simply, the FASB could not demonstrate that their ESO proposal was mandated or logically required by their CF.

AcSEC and SEC Comments on the 1993 ED

An analysis of AcSEC's comment letter to the 1993 ED on Stock Based Compensation indicates that AcSEC framed its criticism of the ED in terms of the

²¹ For example, in pension accounting the firm must estimate employees' tenure at the firm, employees' final pay, employees' longevity, the appropriate discount (settlement) rate, and the long-run rate of return on plan assets. In addition, it is not clear if the liability should be based on the accumulated benefit obligation or on the projected benefit obligation. Deferred taxes involve reliability issues because estimates must be made for when temporary differences will reverse, and whether deferred tax benefits will be realized.

reliability of ESO costs computed using option-pricing models. The AcSEC letter states that:

This majority concludes that the usefulness of financial statements for investment and credit decisions will not be improved by including the expense amounts determined under these models. It believes current or improved disclosure requirements will inform financial statement users adequately about stock options granted to employees . . . AcSEC continues to believe methods other than a minimum value method *will not produce reliable results* that can be compared among similar enterprises . . . While a majority of AcSEC reached the conclusion that the fair value issue remains intractable, AcSEC continues to support fair value in concept. If such values become objectively more determinable through changes in the structure of options, AcSEC will reconsider its views. (emphasis added)

This reinforces the argument that the theoretical hurdles which the 1993 ED could not surmount were timing and measurement issues, and the relevance–reliability trade-off.

An analysis of SEC Commissioners' remarks provides a similar inference. In explaining the difficulties that led to the demise of the 1993 ED, SEC Commissioner Richard Roberts (1994) remarked that:

The first and largest problem with this approach is how to value stock options. Should they be valued at grant date, vesting date, or exercise date? . . . There has been no consensus on the timing or the formula. While the Black-Scholes and binomial pricing models are the most popular for valuing exchange-traded options, they are less effective in valuing options that are non-transferable.

These remarks suggest that the SEC had timing and measurement concerns with the 1993 ED. First, because there is no established view of the ESO grant transaction, it is not clear when the ESOs should be measured. Second, even if one could determine when the ESOs should be measured, the measurement may not be sufficiently reliable. The following remarks by SEC Commissioner Steven M. H. Wallman (1995) also suggest that the SEC was not persuaded by the FASB's arguments: 'I understand the arguments made both for and against a charge to income for stock option compensation. It is wrong to conclude that there can be only one correct answer.' On the other hand, the FASB had argued that there is only one answer—theirs.

Commissioner Roberts further suggests that the measurement and timing problems were exacerbated by the political nature of accounting for stock options, and that the SEC may apply different reliability standards in different cases. He continues, noting that:

A new accounting standard for employee stock options imposing a charge to earnings could potentially have a substantial adverse impact on small, fledgling companies. Therefore, any standard imposing such a charge should be very carefully drawn, or it could have a negative impact on our capital formation system to the detriment of both companies and investors. The problem is that it appears no one can agree on a formula, and I am not sure that a good one exists for this purpose at the present.

By interspersing the theoretical measurement concerns (i.e., 'no one can agree on a formula') with concerns for small company capital formation, Roberts' remarks

suggest that in the absence of the political and resource allocation issues surrounding accounting for stock options, the timing and measurement problems would have been acceptable. A similar sentiment can be found in Commissioner Wallman's remarks: '*Given the highly charged context of the stock option debate*, the FASB approach of requiring disclosure—as opposed to requiring recognition—of the fair value of stock options is an acceptable solution' (emphasis added).

The conclusion from the Commissioners' remarks is that, given the political and resource allocation issues, the FASB had a greater burden of demonstrating that its formula for ESO recognition satisfactorily resolved the timing and measurement problems. In the absence of a strong theoretical justification for the FASB's 1993 ED, the SEC was not willing to risk the possibly negative effects on capital formation and to expend the political capital needed to support the FASB's ED. However, in other cases, where the political and economic stakes are smaller, the timing and measurement issues raised by the 1993 ED would not have been problematic.²²

SEC PERSPECTIVE ON ITS RELATIONSHIP WITH THE FASB

The lingering questions raised by the process in which SFAS 123 was adopted are which group is responsible for considering the political and economic costs of accounting standards, and how the SEC's approach to standard-setting differs from that of the FASB. Dopuch and Sunder (1980, p. 18) struggle to find a role for private standard-setters. They suggest:

First, the Board (FASB) could explicitly recognize the nature of financial accounting as a social activity which affects a varied set of interests, both of those who actively participate and those who do not . . . In its statement of objectives, the Board could define mechanisms for arriving at a compromise ruling after a hearing has been given to all affected groups in society. The Board's primary objective would simply be to arrive at a compromise ruling after considering various points of view on each issue.

However, Dopuch and Sunder (p. 19) conclude by asking: 'Once this role were recognized, what would be the advantages and disadvantages of allowing a private board like the FASB to make compromise decisions?'

A conclusion from the SEC actions and comments on the SFAS 123 project implies that the role Dopuch and Sunder suggest for the FASB has been appropriated by the SEC. In commenting on how the SEC regards its relation with the FASB, SEC Chairman Levitt (1995) states:

²² Gorton (1971) provides a somewhat similar conclusion from his in-depth analysis of the SEC's actions in the standard-setting process surrounding SFAS 19, *Accounting and Reporting by Oil and Gas Producing Companies*. In that case, the SEC took the unprecedented steps of holding public hearings on whether to accept the FASB's standard and then issuing its own standard. Based on interviews with the principal SEC figures involved, Gorton concludes that the SEC did not find the justification offered by the FASB for its standard to be compelling or even convincing. Further, Gorton argues that in the absence of political pressure, the SEC may have accepted the FASB's standard because of the lack of a mandate or an excuse to create a better standard. However, Gorton (p. 41) states that the intense political pressure on oil and gas accounting created a 'destabilizing force which provided the opportunity for the Commission's leadership to extend its current-value initiatives by proposing reserve recognition accounting'.

Both the Commission and the FASB consider accounting proposals in the context of ensuring investor protection and providing unbiased information to the securities markets. *The Commission does have a broader mission*, which includes, among other things, enforcement of the federal securities laws, market regulation, *and facilitation of capital formation*. (emphasis added)

While the facilitation of capital formation is accomplished by reflecting economic activity faithfully, this relation is viewed only as a general, but not a binding guide. Chairman Levitt further states: 'The increased transparency provided by unbiased financial reporting *generally has been considered* to facilitate capital formation, not diminish it' (emphasis added). In other words, the SEC expects the FASB to provide an authoritative practitioner perspective of how accounting data should be presented to report on economic activity as faithfully as possible, and the SEC balances that input with concerns such as the facilitation of capital formation which they, but not the FASB, need to consider. This conception of the FASB's role is consistent with the FASB's stated mission, which is

to establish and improve standards of financial accounting for the guidance and education of the public, including issuers, auditors, and users of financial information . . . To be objective in its decision making to ensure, insofar as possible the neutrality of information resulting from its standards. To be neutral, information must report economic activity as faithfully as possible without colouring the image it communicates for the purpose of influencing behaviour in any particular direction.

Hence, if expensing ESO grants would interfere with capital market activity for small firms, the SEC, but not the FASB, must consider that effect.

This is reflected in comments by SEC Commissioner Wallman and SEC Chief Accountants Walter Schuetze and Michael Sutton. Wallman (1995) comments on the stock option debate that:

I believe FASB's fundamental independence, integrity, and wisdom are essential to its ability to develop high-quality accounting standards. I also prefer to have the private sector set accounting standards subject to Commission oversight, rather than having that responsibility revert to the Commission. *Unless this process remains apolitical*, however, that may become difficult. (emphasis added)

Schuetze (1994), commenting on AcSEC's change of position on ESOs, states:

If public companies are pressuring their outside auditors and AcSEC to take particular positions on financial accounting and reporting issues and outside auditors are subordinating their views to those of their clients, can the outside auditor community continue to claim to be independent? . . . Could such a trend be anything other than an invitation to Congress, *the SEC* and other regulators to regulate more heavily, and more directly? (emphasis added)

Sutton (1996) emphasized the need for professionalism in the U.S. regulatory system:

Implicit in all this is the assumption that private sector standards setters and auditors will act independently . . . Historically, we have relied heavily *on the professionalism* of registrants, auditors, and standard-setters to make the system work . . . the Commission's ability to depend on the professionalism of private sector participants is critical to maintaining the credibility of our system. (emphasis added)

Given the obvious political nature of standard setting in general, and of ESOs in particular, the implication of these remarks is that the SEC, and not the FASB, is the appropriate forum for the political and resource allocation issues to be debated. Moreover, from the perspective of the SEC, the only role for the FASB is to provide an authoritative position exclusively representing that of the profession. SEC Chairman Levitt (1996) specifically notes that the FASB's value to the SEC is derived from the fact that it does not consider political ramifications: 'While I freely believe in the need for free and unfettered debate, there's a process that is insulated from politics . . . This is one reason I'm not receptive to requests that the SEC intervene to soften or delay FASB projects before the process has reached out to all constituents.'

Because it argues for an increase in the political and regulatory importance of the SEC relative to that of the FASB, the SEC's role in the debate on accounting for ESOs may be interpreted as an attempt to increase its regulatory domain. This interpretation of the SEC's behaviour is consistent with Bealing *et al.* (1996). They interpret the SEC's early regulatory actions in the 1930s and 1940s as being motivated by the desire to institutionalize its role and establish itself as part of the political and legal landscape.

SUMMARY AND CONCLUSIONS

This article argues that the effectiveness of the FASB's Conceptual Framework (CF) is undermined by the level of abstraction with which it was written, and to a lesser extent by the lack of guidance on how strongly to emphasize the attribute of relevance. The FASB's CF primarily provides accounting *concepts* or definitions of accounting elements, while its standards provide *views*, or models that relate an economic event to the related accounting elements definitions in its CF. As a result, questions continuously arise about the appropriate accounting model for various economic events, and the FASB's CF may not deliver regulators' political support for its advocacy of a particular reporting rule.

Even without providing definitive views, a CF *can* provide greater political support to standard-setters by explicitly stating that the attribute of relevance should be more heavily emphasized than the attribute of reliability. Such an approach would provide standard-setters with the ability to enlist regulators' support in reporting issues involving uncertainties such as pensions, deferred taxes, estimated current asset values and ESOs. Specifically, regulators could counter arguments that a proposed rule would create unreliable accounting data by pointing to the CF's mandate to pursue relevance even at the cost of reliability. However, the FASB's CF does not provide any support for emphasizing relevance over reliability.

In cases such as employee stock options, accounting for research and development cost (Bierman and Dukes 1975), and capitalization of interest cost (Mozes and Schiff 1995), the FASB appears to have claimed a mandate from its CF when no such mandate exists. When the political opposition to a standard proposed by the FASB is not intense and there are no serious issues concerning resource allocation and capital formation, as in the latter two cases, the proposal may be

acceptable to the SEC despite its weak justification. However, the greater the political activity surrounding a proposed accounting standard, the better the FASB must justify its recommendation to the SEC. In the highly politicized case of ESOs, the FASB did not provide a compelling rationale for its proposals, and its proposals were ultimately rejected.

The FASB's experience with accounting for ESOs leads to the conclusion that it would have been better served by a CF that leads to clearer standard-setting recommendations.²³ To the extent that the CF cannot provide compelling arguments in favour of the FASB's proposals in politicized issues, the political and economic issues will dominate the standard-setting process and the FASB will risk ceding control of these issues to the SEC. If U.S. accounting standards are going to continue to be set in the private sector, it may be necessary for the FASB to revise its CF to provide explicitly accounting models for a number of troublesome events and transactions, and to provide a method for resolving tensions between the relevance and reliability attributes.

The more general conclusion of this paper is that, ideally, conceptual frameworks should contain specific definitions of economic events in terms of accounting elements and an explicit statement whether the attributes of relevance or reliability are of paramount concern. Clearly, the economic meaning of various transactions and the relative importance of the relevance and reliability attributes to financial market participants vary across countries. Hence, one can imagine conceptual frameworks based on the suggested model varying substantially from another, and one can understand why standard-setters in different countries would attempt to 'reinvent the wheel' by developing their own Conceptual Framework of Accounting. By contrast, countries following the U.S. approach should have similar conceptual frameworks because there is little substantive variation in the general description of accounting elements and required data attributes. Hence, if standard-setters in other countries wish to emulate the FASB's approach, they might avoid the cost of developing a conceptual framework by simply adopting the FASB's CF.

REFERENCES

- American Institute of Certified Public Accountants, Accounting Principles Board Opinion Number 25, *Accounting for Stock Issued to Employees*, AICPA, 1972.
- Balsam, S., 'Extending the Method of Accounting for Stock Appreciation Rights to Employee Stock Options', *Accounting Horizons*, December 1994.
- Bealing, W. E., M. W. Dirsmith and T. Fogarty, 'Early Regulatory Actions by the SEC: An Institutional Theory Perspective on the Dramaturgy of Political Exchanges', *Accounting, Organizations and Society*, Vol. 21, No. 4, 1996.
- Beresford, D. R., and R. D. Neary, 'FASB Examines Compensation for Stock Options Plans', *Financial Executive*, April 1986.
- Bierman, H., Jr, and R. E. Dukes, 'Accounting for Research and Development Costs', *Journal of Accountancy*, April 1975.

²³ Gore (1992) argues that another major error in developing the CF was the extravagant expectations the FASB initially associated with the CF project.

- Burton, J. C., 'The SEC and Financial Reporting: The Sand in the Oyster', *Journal of Accountancy*, June 1982.
- Chambers, R. J., 'Ends, Ways, Means and Conceptual Frameworks', *Abacus*, September 1996.
- Collett, P., 'Standard Setting and Economic Consequences: An Ethical Issue', *Abacus*, March 1995.
- DePree, C. D., 'Testing and Evaluating a Conceptual Framework of Accounting', *Abacus*, March 1989.
- Dopuch, N., and S. Sunder, 'FASB's Statements on Objectives and Elements of Financial Accounting: A Review', *The Accounting Review*, January 1980.
- Financial Accounting Standards Board, Statement of Financial Accounting Concepts No. 2, *Qualitative Characteristics of Accounting Information*, FASB, 1980.
- , Statement of Financial Accounting Concepts No. 6, *Elements of Financial Statements*, FASB, 1985.
- , SFAS 123, *Accounting for Stock Based Compensation*, FASB, 1995.
- Foster, T. W., P. Koogler and D. Vickrey, 'Valuation of Executive Stock Options and the FASB Proposal', *The Accounting Review*, 1991.
- , 'Valuation of Executive Stock Options and the FASB Proposal: An Extension', *The Accounting Review*, January 1993.
- Freher, E., 'What the SEC's Proxy Disclosure Rules Mean to Your Executive Compensation Practices', *Journal of Corporate Accounting and Finance*, Winter 1992–3.
- Gerboth, D., 'Research, Intuition, and Politics in Accounting Inquiry', *The Accounting Review*, July 1973.
- Gore, P., *The FASB Conceptual Framework Project 1973–1985: An Analysis*, Manchester University Press, 1992.
- , 'The Practical Use of Conceptual Frameworks For Financial Accounting', *Advances in International Accounting*, Vol. 8, 1995.
- Gorton, D. E., 'The SEC Decision not to Support SFAS 19: A Case Study of the Effect of Lobbying on Standard Setting', *Accounting Horizons*, March 1991.
- Hemmer, T., S. Matsunaga and T. Shevlin, 'Estimating the "Fair Value" of Employee Stock Options with Expected Early Exercise', *Accounting Horizons*, December 1994.
- , 'The Influence of Risk Diversification on the Early Exercise of Employee Stock Options by Executive Officers', *Journal of Accounting and Economics*, Vol. 21, 1996.
- Horngren, C. T., 'Uses and Limitations of Conceptual Frameworks', *Journal of Accountancy*, April 1981.
- Huddart, S., 'Employee Stock Options', *Journal of Accounting and Economics*, Vol. 18, 1994.
- Huddart, S., and M. Lang, 'Employee Stock Option Exercises: An Empirical Analysis', *Journal of Accounting and Economics*, Vol. 21, 1996.
- Joyce, E. J., R. Libby and S. Sunder, 'Using FASB's Qualitative Characteristics in Accounting Policy Choices', *Journal of Accounting Research*, Autumn 1982.
- Ketz, J. E., and W. K. Kunitake, 'An Evaluation of the Conceptual Framework: Can it Resolve The Issues Related to Accounting for Income Taxes?', *Advances in Accounting*, Vol. 6, 1988.
- Kulatilaka, N., and A. J. Marcus, 'Valuing Employee Stock Options', *Financial Analysts Journal*, November–December 1994.
- Lambert, R. A., D. F. Larcker and R. A. Verrecchia, 'Portfolio Considerations in Valuing Executive Compensation', *Journal of Accounting Research*, Spring 1991.
- Levitt, A., 'An Exchange Between the Honorable Edward J. Markey, Chairman U.S. House of Representatives Subcommittee on Telecommunications and Finance, Committee of Energy and Commerce and the Honorable Arthur Levitt, Jr., Chairman, Securities and Exchange Commission', *Accounting Horizons*, March 1995.
- , 'The Accountant's Critical Eye', Remarks at the 24th Annual National Conference on Current SEC developments, AICPA, Washington, D.C., 10 December 1996.
- Merton, R. C., *Continuous-Time Finance*, Basil Blackwell, 1990.

FASB, CONCEPTUAL FRAMEWORK AND ESO

- Milburn, J. A., 'Building a Better Conceptual Framework', *CA Magazine*, December 1991.
- Mozes, H. A., 'A Framework for Normative Accounting Research', *Journal of Accounting Literature*, Vol. 11, 1992.
- , 'An Upper Bound for the Firm's Cost of Employee Stock Options', *Financial Management*, Winter 1995.
- Mozes, H. A., and A. I. Schiff, 'A Critical Look at SFAS 34: Capitalization of Interest Cost', *Abacus*, March 1995.
- Noreen, E., 'Comment: Measuring the Compensation Element in Employee Stock Option Plans', *Journal of Accounting, Auditing, and Finance*, Fall 1979.
- Noreen, E., and M. Wolfson, 'Equilibrium Warrant Pricing Models and Accounting for Executive Stock Options', *Journal of Accounting Research*, Autumn 1981.
- Poster, C. Z., 'A Look at the Future of Stock Options', *Financial Executive*, April 1986.
- Robbins, B., 'FASB's Long Look at Stock Compensation Plans', *Journal of Accountancy*, August 1988.
- Roberts, R., 'Remarks on Current Disclosure Issues', *Institute of Management Accountants Annual SEC/FASB Accounting and Reporting Conference*, New York, 14 December 1994.
- Securities and Exchange Commission, Accounting Series Release No. 150, *Statement of Policy on the Establishment and Improvement of Accounting Principles and Standards*, SEC, 20 December 1973.
- Schuetze, W., 'Remarks to the 1994 AICPA National Conference on Current SEC Developments'. Cited in *Journal of Accountancy*, March 1994.
- Solomons, D., 'The Politicization of Accounting', *Journal of Accountancy*, Vol. 146, No. 5, 1978.
- , 'The FASB's Conceptual Framework: An Evaluation', *Journal of Accountancy*, June 1986.
- Sutton, M. H., 'Remarks at the 24th Annual National Conference on Current SEC Developments', AICPA, Washington, D. C., 10 December 1996.
- Wallman, S. M. H., 'Remarks Before the American Society of Corporate Secretaries 49th Annual Conference,' White Sulphur Springs, 1 July 1995.
- Watts, R. L., and J. L. Zimmerman, 'Towards a Positive Theory of the Determination of Accounting Standards', *The Accounting Review*, Vol. 53, No. 1, 1978.
- Zeff, S. A., 'Commentary: A Perspective on the U.S. Public/Private-sector Approach to the Regulation of Financial Reporting', *Accounting Horizons*, March 1995.

CHRISTOPHER NOBES

Towards a General Model of the Reasons for International Differences in Financial Reporting

The article first examines the existing modelling literature, which contains a large number of suggested reasons for international differences in accounting. After examining terminological problems, a preliminary parsimonious model is developed to explain the initial split of accounting systems into two classes. The term 'accounting system' is used here to mean the financial reporting practices used by an enterprise. A country might exhibit the use of several such systems in any one year or over time. Consequently, it should be systems and not countries that are classified. The model proposes a two-way classification using two variables: the strengths of equity markets and the degree of cultural dominance. Implications for classifiers and rule-makers are suggested.

Key words: Classification; International accounting.

INTRODUCTION AND PREVIOUS MODELLING

Many reasons have been suggested in the literature for international differences in financial reporting. Some authors state that they are merely listing plausible reasons; few provide precise hypotheses or tests of them, as noted by Meek and Saudagaran (1990). Wallace and Gernon (1991) complain about the lack of theory in international comparative accounting. This article seeks to address this.

The literature (e.g., Choi and Mueller, 1992, ch. 2; Radebaugh and Gray, 1993, ch. 3; Belkaoui, 1995, ch. 2; Nobes and Parker, 1995, ch. 1) offers a large number of possible reasons for international differences (see Table 1) but no general theory linking the factors. Schweikart (1985) and Harrison and McKinnon (1986) provide some elements of a general theory, without specifying which factors are major explanatory variables for accounting practices. Two somewhat similar theoretical models of the reasons for accounting differences are those of Gray (1988) and of Douppnik and Salter (1995; hereafter DS). Gray suggests a model based on cultural factors, as examined later. DS provide a synthesis of previous discussions, leading to a framework, which is simplified here as in Figure 1 so that an alternative can

CHRISTOPHER NOBES is Coopers & Lybrand Professor of Accounting at the University of Reading. The author is grateful for helpful comments on earlier drafts from Michael Page, Bob Parker, Alan Roberts and Autar Singh, and from the editor and the referees of this journal.

INTERNATIONAL DIFFERENCES IN FINANCIAL REPORTING

TABLE 1

REASONS PREVIOUSLY PROPOSED FOR INTERNATIONAL ACCOUNTING DIFFERENCES

- | | |
|----|---|
| 1 | Nature of business ownership and financing system |
| 2 | Colonial inheritance |
| 3 | Invasions |
| 4 | Taxation |
| 5 | Inflation |
| 6 | Level of education |
| 7 | Age and size of accountancy profession |
| 8 | Stage of economic development |
| 9 | Legal systems |
| 10 | Culture |
| 11 | History |
| 12 | Geography |
| 13 | Language |
| 14 | Influence of theory |
| 15 | Political systems, social climate |
| 16 | Religion |
| 17 | Accidents |

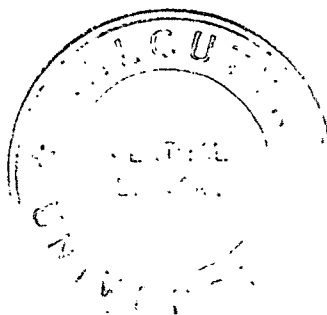
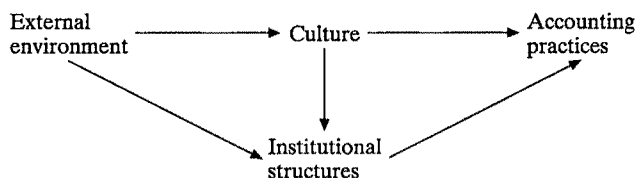


FIGURE 1

A SIMPLIFICATION OF DS'S MODEL OF DEVELOPMENT



Source: Adapted from Douppnik and Salter (1995), exhibit 1.

be proposed later. One difficulty emerging from Figure 1 is that four of DS's ten variables (see Table 2) are cultural (based on Gray) and six are institutional, but culture is seen as giving rise to the institutions. This suggests the possibility of double counting. A related difficulty with DS is that there is no attempt to connect their six institutional factors to see whether they might cause each other. In particular, it is suggested later that four of the six (taxation, inflation, level of education and stage of economic development) are not necessary. DS thus have provided a mix of theories, not a general theory.

A number of terminological issues are raised by studying this literature. These need to be addressed before attempting to develop a general model.

TABLE 2

DS'S INDEPENDENT VARIABLES

Cultural	Institutional
Individualism	Legal system
Power distance	Capital market
Uncertainty avoidance	Tax
Masculinity	Inflation levels
	Level of education
	Level of economic development

SOME TERMINOLOGICAL ISSUES

One of the problems of identifying reasons for differences, and perhaps then classifying accounting systems, is a lack of clarity about what is being examined or classified. This article discusses accounting *practices*, using 'accounting' to mean published financial reporting. In some jurisdictions, the *rules* of financial reporting may be identical, or very similar, to the practices, but sometimes a company may depart from rules or may have to make choices in the absence of rules. The Price Waterhouse data, used by many researchers,¹ seem to contain a mix of *de facto* and *de jure* aspects 'in a perplexing way' (Rahman *et al.*, 1996).

Another difficulty concerns the word 'system' (Roberts, 1995). DS use it to cover such things as regulatory agencies. Others (e.g., Nair and Frank, 1980) have concentrated on a corpus of accounting rules or practices. This article follows the latter route, that is, an 'accounting system' is a set of practices used in a published annual report. Although this is a narrow definition, these practices will reflect the wider context in which they operate.

Another issue is whether to separate disclosure from measurement practices. Nair and Frank (1980) show that this can be important. Nobes (1983) looks at measurement practices only. DS acknowledge the distinction but add the categories together. It seems appropriate to include the presence or absence of certain key disclosures (e.g., earnings per share, cash flow statements) as elements of a system, and this is discussed later.

A further issue is to determine whose accounting practices are being examined. The Price Waterhouse data seem, in practice, to have reported on companies audited by Price Waterhouse (see Nobes, 1981). DS (p. 198) specify the measurement and disclosure practices of 'companies', which is vague, particularly for disclosure practices. Nobes (1983, p. 5) chose the measurement practices of 'public companies', which the context suggests meant those with securities which are traded publicly.

A related point is that all the researchers look at classifications of *countries* by their accounting environments or systems. Roberts (1995) highlighted this problem,

¹ For example, Da Costa *et al.* (1978); Frank (1979); Nair and Frank (1980).

noting that a country could have more than one system, for example, one system for companies with publicly traded securities, and another for small private companies.² Similarly, some large public companies may adopt very different practices from what is 'normal' for most large companies in the country. This is becoming especially obvious in continental Europe, with the use of U.S. rules or International Accounting Standards (IAS) by some very large companies. Therefore, it may be useful to refer to a country's 'dominant accounting system', which might be defined as that used by enterprises encompassing the majority³ of the country's economic activity. Hereafter, references to a country's 'system' should be taken to mean its dominant system.

In some countries, the law requires or commercial pressures dictate that a large number of companies use the same system. For example, in the U.K., most provisions of the Companies Act 1985 and of accounting standards apply to all companies. In other countries, a particular accounting system might be legally or commercially imposed on a small minority of companies, as in the U.S. where 'generally accepted accounting principles' are legally imposed on only that small proportion of companies registered with the Securities and Exchange Commission. In both these rather different cases, there is still clearly a dominant system as defined above.

Nevertheless, as there can be more than one system in a country it would be more useful to specify accounting systems, and then to note that particular companies in particular countries at particular dates are using them. Of course, for labelling purposes, it might be useful to refer, for example, to the system used in 1998 by U.S. public companies. With labels, it will then be possible to identify separate influences on, and to show separate places in the classification for, for example, 'normal' German public companies in 1998, compared to the group accounts of such companies as Daimler-Benz, Deutsche Bank and Bayer in 1998.

Also, a country's accounting system may change dramatically over time, for example, as a result of economic or political revolutions (c.f. China, Russia, Poland, etc.). Less dramatically, accounting in a country can change quite significantly as a result of new laws (e.g., Spain from the late 1980s as a consequence of EC Directives).⁴

Lastly, companies in two countries (e.g., the U.K. and Ireland) can use extremely similar accounting practices (i.e., perhaps the same 'system'). In a similar manner to the characteristics of human individuals, the detailed elements of a company's accounting practices can differ so much that the number of different sets of practices is effectively infinite. Nevertheless, it is useful for some purposes to recognize that humans all belong to the same species. The individual members

² I am grateful to my colleague, Autar Singh, for discussions that clarified my thoughts on this.

³ Researchers would have to decide whether to start from the smallest enterprise or from the largest. Presumably, it would make sense to start from the largest, since this would involve far fewer enterprises, and since the small enterprises would not be publishing any financial reports in most countries.

⁴ See, for example, Gonzalo and Gallizo (1992), ch. 3.

of the species are all different but have certain features in common. By analogy, a certain degree of variation among company practices may be allowed without having to abandon the idea that the companies are all using the same system.

AN INITIAL STATEMENT OF A GENERAL MODEL

The proposal here, which will be explained more fully later, is that the major reason for international differences in financial reporting is different purposes for that reporting.

Financing Systems

In particular, at a country level, it is suggested that the financing system is relevant in determining the purpose of financial reporting. Zysman (1983) distinguishes between three types of financing system: (a) *capital market based*, in which prices are established in competitive markets; (b) *credit-based system: governmental*, in which resources are administered by the government; and (c) *credit-based system: financial institutions*, in which banks and other financial institutions are dominant.

Zysman suggested that the U.K. and the U.S.A. have a type (a) system; France and Japan a type (b) system; and Germany a type (c) system. According to Zysman, in all systems companies rely considerably on their own profits for capital but their external sources of funds differ. Where external long-term finance is important, securities are the main source in the capital market system. In such countries, there is a wide range of capital instruments and of financial institutions, and the latter have an arm's-length relationship with companies. Investors change their holdings through the secondary securities markets, which are large. In credit-based systems, the capital market is smaller, so companies are more reliant on whoever grants credit. This usually means banks, whether under the influence of governments or not. Cable (1985) examined the importance of banks in the German economic system. In this system, investors will find it more difficult to adjust their holdings, so they may be more interested in long-run control of the management.

For the purposes of this article, a development of the Zysman classification is proposed, as in Table 3. For this, the concept of 'insider' and 'outsider' financiers needs to be developed. This idea of insiders and outsiders, which has its roots in the finance literature, has been used before for accounting purposes (e.g., see Nobes, 1988, p. 31), and to discuss contrasting corporate governance systems (e.g., Franks and Mayer, 1992; Kenway, 1994). 'Outsiders' are not members of the board of directors and do not have a privileged relationship with the company (e.g., such

TABLE 3

FINANCING SYSTEMS

	Strong credit	Strong equity
Insiders dominant	I	III
Outsiders dominant	II	IV

as that enjoyed by a company's banker who is also a major shareholder). They include both private individual shareholders and some institutions. For example, insurance companies and unit trusts normally have widely diversified portfolios, so that any particular holding does not constitute a large proportion of a company's capital. Therefore, such institutions should perhaps be counted as outsiders. By contrast, 'insiders' such as governments, banks, families and other companies are all likely to have close, long-term relationships with their investees. This will involve the private provision of timely and frequent accounting information.

Both of Zysman's credit-based systems fall into category I of Table 3. Category II (a credit-based system with a large amount of listed debt with outsider owners) is plausible but uncommon. A possible example is discussed near the end of this subsection. Category III is an equity-based system where most shares are owned by insiders. In Japan, for example, there are large numbers of listed companies and a large equity market capitalisation, but the shares are extensively owned by banks and other companies (Nobes and Parker, 1995, p. 9 and ch. 13).

Category IV systems involve important equity markets with large numbers of outsider shareholders. In these systems there will be a demand for public disclosure and for external audit because most providers of finance have no involvement in management and no private access to financial information. This is the classic setting of most of the finance literature (e.g., Jensen and Meckling, 1976; Beaver, 1989). More recently, a connection between more disclosure and lower cost of equity capital has been examined in such a context (Botosan, 1997). Pursuing this line, this article suggests that the key issue for financial reporting is the existence or otherwise of such Category IV financing. Ways of measuring this are proposed below.

In a particular country, there may be elements of several of these four systems. For example, small companies are unlikely to be financed by a Category IV system in any country. However, for the moment, let us assume that the economic activity in any country is dominated by one particular financing system. The hypothesis predicting a correlation between the style of corporate financing and the type of accounting system is that the rule-makers for, and the preparers of, financial reports in equity-outsider (Category IV) countries are largely concerned with the outside users. The conceptual frameworks used by the rule-makers of the U.S., the U.K., Australia and the IASC⁵ make it clear that this is so. In particular, they state that they are concerned with reporting financial performance and enabling the prediction of future cash flows for relatively sophisticated outside users of financial statements of large companies. By contrast, credit-based countries (mostly Category I) will be more concerned with the protection of creditors and therefore with the prudent calculation of distributable profit. Their financiers (insiders) will not need externally audited, published reports. This difference of purpose will lead to differences in accounting practices. The less common categories (II and III) will be discussed later.

⁵ Statements of Financial Accounting Concepts of the FASB, particularly SFAC 1, *Objectives*; the similar chapter 1 of the ASB's draft *Statement of Principles; Statements of Accounting Concepts* of Australia; and the IASC's *Framework for the Preparation and Presentation of Financial Statements*, para. 15.

TABLE 4

EXAMPLES OF FEATURES OF THE TWO ACCOUNTING CLASSES

Feature	Class A	Class B
Provisions for depreciation and pensions	Accounting practice differs from tax rules	Accounting practice follows tax rules
Long-term contracts	Percentage of completion method	Completed contract method
Unsettled currency gains	Taken to income	Deferred or not recognised
Legal reserves	Not found	Required
Profit and loss format	Expenses recorded by function (e.g., cost of sales)	Expenses recorded by nature (e.g., total wages)
Cash flow statements	Required	Not required, found only sporadically
Earnings per share disclosure	Required by listed companies	Not required, found only sporadically

Empirical researchers would need to establish relevant measures to distinguish the categories (as done, for example, by La Porta *et al.*, 1997). These might include the number of domestic listed companies in a country (or this deflated by size of population), the equity market capitalization (or this deflated by GDP), and the proportion of shares held by 'outsiders'. Although the boundary between the types of financing system may sometimes be unclear (as in many of the classifications in social science, languages, law or, even, biology), the contrast between a strong equity-outsider system and other systems should be clear enough, as the Appendix demonstrates for some countries.

Financial Reporting Systems

It is proposed that financial reporting systems should be divided initially into two classes, for the moment labelled as A and B. Class A corresponds to what some have called Anglo-Saxon accounting and Class B to continental European. To assist researchers in measuring a system, some core features of the two systems are suggested in Table 4. For example, systems of Class A will share all, or a large proportion of, the practices shown for that class. Clear examples of actual systems exhibiting *all* of the features exist.⁶

It is proposed that, for developed countries,⁷ the extent that a particular country is associated with Class A or Class B accounting is predictable on the basis of its position with respect to financing systems. If the present accounting system was developed in the past, then reference to the past importance of financing systems

⁶ For example, Australia, the U.S. and the U.K. exhibit *all* the features of Class A, whereas the dominant systems in France, Germany and Italy exhibit *all* the features of Class B (although a few consolidated statements use a different system and depart from some aspects). Most items in Table 4 are covered by the relevant country chapters of Nobes and Parker (1995) or, for example, see Scheid and Walton (1992) for France, or Gordon and Gray (1994) for the UK.

⁷ The idea of 'developed' or 'culturally self-sufficient' is examined further later.

will be relevant. Strong equity-outsider markets (Category IV) lead to Class A systems; otherwise Class B systems prevail.

Even if a particular country is traditionally associated with weak equity markets and therefore Class B accounting, the country might change. For example, China has been changing in the direction of a strong equity-outsider market and Class A accounting (Chow *et al.*, 1995). However, the accounting might remain stuck in the past for legal or other reasons of inertia. Nevertheless, in some countries, certain companies might be especially commercially affected. They might adopt Class A accounting by using flexibility in the national rules, by breaking national rules, or by producing two sets of financial statements. Some German examples of these routes can be given. Bayer's consolidated financial statements (for 1994 onwards) have used non-typical German rules, that are different from those used in its parent's statements, in order to comply with International Accounting Standards (IAS). Further, officials of the Ministry of Finance have announced that departure from German rules would be 'tolerated' for such group accounts.⁸ In the case of Deutsche Bank (e.g., for 1995), two full sets of financial statements were produced, under German rules and IAS, respectively.

A related issue is that, as noted earlier, there are two aspects of financial reporting which can be separated: measurement and disclosure (e.g., Nair and Frank, 1980). Table 4 contains examples of both aspects. As explained below, the measurement issues seem to be driven by the equity/creditor split, and the disclosure issues by the outsider/insider split. The equity/creditor split leads to different kinds of *objectives* for financial reporting. As suggested earlier, systems serving equity markets are required to provide relevant information on performance and the assessment of future cash flows in order to help with the making of financial decisions. Systems in a creditor environment are required to calculate prudent and reliable distributable (and taxable) profit. By contrast, the outsider/insider split leads to different *amounts* of information: where outsiders are important, there is a demand for more published financial reporting.

It has been assumed here that equity financing systems are normally those which are associated with large numbers of outsiders, so that Class A systems are an amalgam of equity and outsider features. However, if there were countries (Category II of Table 3) with large markets for listed debt but not for listed equities, then one might expect a financial reporting system with the high disclosures of Class A but the measurement rules of Class B. Perhaps the closest example of a system with Class B measurement rules but high disclosures is the German system for listed companies.⁹ Germany does indeed have an unusually large market in listed debt.¹⁰

⁸ Herr Biener of the German Finance Ministry announced this at the board meeting of the International Accounting Standards Committee in Amsterdam in May 1996. In 1998, German law changed in order specifically to allow this.

⁹ This feature of German accounting was highlighted by Nair and Frank (1980), who prepared separate classifications based on measurement and disclosure practices.

¹⁰ For example, in 1993, the number of listed bonds in Germany was 13,309, whereas the number in France was 2,516 and in the U.K. 2,725 (data from *European Stock Exchange Statistics*, Annual Report, 1993).

This way of distinguishing between the forces acting on measurement and those acting on disclosure may help to resolve the difficulties of a cultural explanation as discussed by Baydoun and Willett (1995, pp. 82–8).

Category III (equity-insider) financing would not produce Class A accounting because published financial reporting is unimportant. The main financiers may be interested in performance and cash flows but they have access to private ‘management’ information.

Colonial Inheritance

Some countries are affected by very strong external cultural influences, perhaps due to their small size or underdeveloped state or former colonial status. Such culturally dominated countries are likely to be using an accounting system based on that of the influential country even if this seems inappropriate to their current commercial needs (Hove, 1986).

Colonial inheritance (Factor 2 in Table 1) is probably the major explanatory factor for the general system of financial reporting in many countries outside Europe (Briston, 1978). It is easy to predict how accounting will work in Gambia (British) compared to neighbouring Senegal (French).¹¹ The same general point applies to Singapore (Briston and Foo, 1990) or Australia (Miller, 1994). Colonial inheritance extends of course to legal systems and to other background and cultural factors, not just to direct imports of accounting (Parker, 1989). Allied to this are the effects of substantial investment from another country, which may lead to accountants and accounting migrating together with the capital.

Another influence is invasions (Factor 3) which may lead to major influence on accounting, as is the case with Japanese,¹² French,¹³ and German¹⁴ accounting. However, when the invader retires, any foreign accounting can be gradually removed if it does not suit the country: Japan closed down its Securities and Exchange Commission when the Americans left, whereas France retained its accounting plan in order to aid reconstruction after World War II (Standish, 1990).

WHY OTHER FACTORS MAY BE LESS USEFUL

If the above conclusions are accepted (i.e., that a general two-class model of financial reporting systems can be built which rests on only the importance of financing systems and colonial inheritance), then most of the seventeen factors listed in Table 1 seem unnecessary as explanatory independent variables, at least for the initial two-class classification. This section explains why, starting with DS’s factors.

¹¹ An unpublished PhD thesis by Charles Elad (University of Glasgow, 1993) shows the colonial influences clearly.

¹² Japan’s SEC, its structure of Securities Laws and its stock market owe much to U.S. influence during the occupation following World War II.

¹³ The distinguishing feature of French accounting, the *plan comptable*, was first adopted in France while under German occupation (Standish, 1995).

¹⁴ The German accounting plan, though copied in France, was abolished by the occupying Western powers after World War II. A version survived in the communist East Germany until reunification.

Tax

Previous writers (e.g., Nobes, 1983) have not been helpful by listing tax as one of the major causes of accounting differences. These writers have, in effect, suggested that Class A accounting systems are not dominated by tax rules whereas Class B systems are; and therefore, that the tax difference is one of the reasons for the difference in accounting systems. However, the disconnection of tax from accounting in Class A systems may be seen as a *result* of the existence of a competing purpose for accounting rather than the major cause of international accounting differences. Lamb *et al.* (1995) look at this in detail, concluding that:

1. Rules for the determination of the taxable profit of businesses will be important in all countries (assuming that taxation of profit is significant).
2. Without some major competing purpose for accounting for which tax rules are unsuitable, tax rules made by governments will therefore tend to dominate accounting, so that tax practices and accounting practices are the same (as in Class B).
3. In some countries (or for some companies), there is the major competing purpose of supplying financial reports to equity-outsider markets (for which tax rules are unsuitable). In this case, for many accounting topics, there will be two sets of accounting rules (and practices): tax rules and financial reporting rules (as in Class A).

Consequently, the tax variable is not needed to explain the difference between Class A and Class B systems. Nevertheless, for those systems where tax and accounting are closely linked (Class B), international differences in tax rules do create international accounting differences. However, these are detailed differences *within* a class of accounting systems which all share the major feature of being dominated by tax rules, which is one of the distinguishing marks of the class.

There is a further important connection here. The equity/credit split in financing, as discussed earlier, coincides with the proposed equity-user/tax-user split: accounting systems designed to serve creditors are systems dominated by tax rules. This is because the calculation of the legally distributable profit (to protect creditors) and the calculation of taxable profit are both issues in which governments are interested. The calculation of legally distributable profit is a different purpose from the calculation of taxable profit but it is not 'competing' in the sense of requiring a different set of rules because both calculations benefit from precision in the rules¹⁵ and from the minimization of the use of judgment,¹⁶ which is not the case for the estimation of cash flows.

¹⁵ For example, in both the U.K. and Germany (typical Class A and Class B countries, respectively), there are large numbers of legal cases on the determination of taxable income and some on the determination of distributable income, but there are few or none on the determination of consolidated accounting profit (i.e., cases where there is no tax motivation).

¹⁶ In the U.K., and recently in the U.S. with SFAS 115, certain assets are revalued above historical cost; and unsettled profits are taken to income (e.g., on long-term contracts and on foreign currency monetary balances). None of this is possible under German law.

Incidentally, DS follow previous writers and suggest that, 'In many countries, tax laws effectively determine accounting practice' (p. 196). However, they then find that tax is not a useful independent variable in explaining accounting differences. It is argued above that tax is not an independent variable for the main classificatory split. DS failed to find even a correlation, probably because they mis-specified the tax variable by using the marginal rate of corporate income taxes. This measure seems inappropriate for several reasons. First, tax rates change dramatically over time, without any obvious effect on accounting (e.g., the top U.S. rate fell from 46 per cent to 34 per cent in 1987; the main rate in the U.K. rose in 1973 from 40 per cent to 52 per cent, and then fell to 33 per cent in 1991). Second, many systems have more than one marginal rate (e.g., in Germany in 1995, 45 per cent for retained profit but 30 per cent for distributed profit; and, in the U.K., 33 per cent for large companies but 25 per cent for small). Third, the tax burden depends greatly on the definition of taxable income not just on the tax rate. More importantly, in countries with a small connection between tax and accounting (typical of Class A), the tax rate will have little effect on accounting; and in countries with a close connection (typical of Class B), the effect of tax on accounting will be in the same direction and probably almost as strong whether the rate is 30 per cent or 50 per cent. For all these reasons, the level of the marginal rate of tax will not help to predict the financial reporting system.

Level of Education

DS's variable here is the percentage of population with tertiary education. It is hard to see how one could explain the major accounting differences on this basis. Can one explain the large accounting differences between, on the one hand, the U.K., the U.S. and the Netherlands (where Class A dominates) and, on the other hand, France, Germany and Italy (where Class B dominates) on the basis of the rather similar levels of tertiary education? Again, can one explain the remarkable similarities between accounting in Malawi, Nigeria and Zimbabwe (Class A countries) and the U.K. (also Class A) on the basis of the rather different levels of tertiary education? Instead there seems to be a connection with the 'colonial inheritance' point, as discussed earlier and as taken up again in the 'level of economic development' point below. Thus it is not surprising that the education variable did not help DS. Previous suggestions related to this factor (e.g., Radebaugh, 1975) seem, more plausibly, to involve the comparison of developed with less developed countries.

Different levels of professional accounting education might be relevant (Shoenthal, 1989), perhaps especially in developing countries (e.g., Parry and Grove, 1990). However, Nobes (1992) casts doubt upon the relevance of this type of factor for classification. To the extent that this is not another issue related to developed versus developing countries, differences in professional education might be covered by Factor 8 in Table 1 (age and size of accountancy profession) and may be a *result* of accounting differences rather than their cause.

Level of Economic Development

It is suggested that the key issue here is not the influence of the stage of economic development on financial reporting (as chosen by DS). Gernon and Wallace (1995, p. 64) agree that there is 'no conclusive evidence' about the relationship. The problem is that, while many African countries with a low level of development have accounting systems rather like the U.K.'s, some have completely different accounting systems rather like that in France. By contrast, the U.K. or the Netherlands have a rather similar level of economic development to that of Germany or Italy but completely different accounting systems.

It would seem plausible to argue that, if accounting systems were indigenously created in all countries, then they would develop differently in developed and undeveloped economies. However, it is suggested that this point is largely overridden by the proposition that developing countries are likely to be using an accounting system invented elsewhere. Perhaps the system has been forced on them, or they have borrowed it. Either way, it is usually possible to predict accounting in such countries by looking at the source of the external influences. Therefore, the level of development is not the key predictor for the split between Class A and Class B. Cooke and Wallace (1990) seem to support the distinction between developed and developing countries when it comes to the influence of various environmental factors on accounting.

Legal Systems

For developed Western countries and for many others (e.g., Japan, South America and most of Africa), it is possible to split countries neatly into codified legal systems and common law systems (David and Brierley, 1985). As DS note, this is of great relevance to the regulatory system for accounting. However, there is a high degree of correlation between equity-outsider financing systems and common law countries, and between credit-insider systems and codified law.¹⁷ On the whole, therefore, the same groupings would result from using a legal system variable rather than from using a financing system variable, as DS find. This again suggests the possibility of double counting. The exception of the Netherlands, which raises further doubts about using the legal variable for accounting classification, is explained below.

For culturally dominated countries, both the legal and accounting systems are likely to have been imported from the same place, so the correlation between these two variables is unsurprising. Both factors can be explained by the colonial influence factor, so the legal factor is not needed. For other countries, there may be aspects of the common law system which predispose a country towards the creation of strong equity-outsider systems (La Porta *et al.*, 1997), but going that far back in the causal chain is not necessary for the present model. For present purposes, it may be more useful to specify the legal variable as the regulatory system for accounting rather than the more general legal system. The variable would be

¹⁷ This is examined in Nobes and Parker (1995, ch. 1).

measured by locating the source of the most detailed accounting regulations. A 0/1 variable would contrast (i) rules made by professional accountants, company directors, independent bodies, stock exchanges and equity market regulators, and (ii) rules made by tax authorities, government ministries (other than those concerned primarily with listed companies) and legal bureaucrats.

Once more, it could be argued that this version of the legal variable is not independent but is dependent on the financing variable. In strong equity-outsider systems, commercial pressure gives the strongest power over financial reporting to group (i) because, since the financial reporting for the equity/outside uses separate rules from tax rules, there is no need for group (ii) to control them. In particular, many of the disclosures (e.g., consolidated financial reports, cash flow statements, segmental reporting, interim reporting) are not relevant for tax or distribution purposes in most jurisdictions. Financial institutions and large companies are sufficiently powerful to persuade group (ii) to allow financial reporting to respond to commercial needs. In common law countries, the importance of group (i) creates no problems of jurisprudence because non-governmental regulation is commonplace. In the rare case of a codified law country with a strong equity market (e.g., the Netherlands), the regulatory system for financial reporting can still give prominence to group (i) although this creates tensions (Zeff *et al.*, 1992). In all systems, group (ii) retains full control over tax rules.

Inflation Levels

Another factor included by DS is the rate of inflation and, once more, previous writers have not been helpful here. For example, although Nobes (1983) did not include inflation as a key variable, Nobes and Parker (1995, p. 19) suggested that 'Without reference to this factor, it would not be possible to explain accounting differences in countries severely affected by it'. However, on reflection, the more important issue is illustrated by other points that they make in the same section:

1. 'accountants in the English-speaking world have proved remarkably immune to inflation when it comes to taking decisive action';
2. 'in several South American countries, the most obvious feature . . . is the use of methods of general price-level adjustment';
3. 'the fact that it was *governments* which responded to inflation in France, Spain, Italy and Greece . . . is symptomatic of the regulation of accounting in these countries'.

In other words, any accounting system would have to respond at some level of inflation sustained for a certain length of time.¹⁸ The key points are who responds and how they respond. The nature of these responses to inflation is a good indicator of the regulatory system for accounting. In countries where Class A accounting is dominant, professional accountants respond; in countries where Class B accounting is dominant, governments respond within the framework of the tax

¹⁸ From observation of Anglo-Saxon countries, it seems that inflation of above 10 per cent for several years will cause a response (e.g., in the U.K. in the early 1950s or early 1970s), and the same applies to some continental European countries in the 1970s (Tweedie and Whittington, 1984).

system.¹⁹ Differential inflation does not cause the difference between Class A and Class B accounting, the regulators typical to the two classes respond differently to it. However, as with some other factors, differential inflation response may lead to differences between the systems *within* Class A or *within* Class B.

Culture

Culture (defined by Hofstede as 'the collective programming of the mind') is clearly a plausible cause of accounting differences as proposed by Gray's (1988) application of Hofstede's (1980) theory. DS's four culture variables (see Table 2) were drawn from Hofstede. However, the attempt to use cultural variables entails large problems (Gernon and Wallace, 1995, pp. 85, 90, 91). Baydoun and Willett (1995, p. 69) also suggest that the mechanisms of the effects are not obvious, and: 'such is the nature of the concepts involved and the state of the available evidence that it is questionable whether Gray's adaptation of Hofstede's theory can in fact be empirically validated in the usual scientific sense' (p. 72).

For the purposes of this article, one can agree with Gray that culture can at least be seen as one of the background factors leading to more direct causes of accounting differences (such as the financing system). Culture may be of more direct help when examining other issues, for example, differences in the behaviour of auditors (Soeters and Schreuder, 1988). It will also be useful later to divide countries into culturally self-sufficient and culturally dominated. As noted in the previous section, the latter countries (e.g., colonies or former colonies) might be expected to adopt practices from other countries. In this sense, culture might indeed overwhelm other factors for certain countries.

Broad Factors

Others of the seventeen factors of Table 1, not proposed by DS but elsewhere in the literature, are too wide to be useful and can be accommodated within more specific factors. On these grounds, history and geography (Factors 11 and 12) can be removed. In a sense, 'history' explains everything, but this is not helpful unless it is known which part of history. For example, colonial history and the history of the corporate financing system are likely to be particularly relevant, so other factors can cover this.

'Geography' is also too broad a factor to be useful. It seems unlikely that the physical nature of a country has a major effect on its dominant class of accounting. For example, the Netherlands and Belgium have very different accounting, although they are similar in physical environment. By contrast, the U.K. and Australia have similar accounting although they are dramatically different in climate, terrain and type of agriculture. A country's location may be relevant for other factors (such as colonial inheritance and invasions) or for certain aspects of its financial history (such as the fact that maritime countries may tend to develop

¹⁹ For example, many South American countries respond with compulsory government-controlled systems of general price level adjusted accounting, whereas English-speaking countries responded with rules written by the profession (although there was government involvement) which required some supplementary disclosures (Tweedie and Whittington, 1984).

certain types of trading or markets). However, the relevant aspects of geography should be picked up by other factors. In the meantime, one merely notes that location seems to be overwhelmed by other factors in the sense that New Zealand has rather similar accounting to the distant U.K.; and the Netherlands has very different accounting from its neighbours, Germany and Belgium.

Covariation

Other factors may involve covariation rather than causation. For example, the fact that many English-speaking countries have similar accounting practices is probably not caused by their shared language (Factor 13): the language was inherited with the accounting or with other factors which affect accounting. Language similarities may contribute to the strength of cultural dominance, and language differences may slow down the transfer of accounting technology. However, these points do not make language a key independent variable.

Theory

Theory (Factor 14), in the form of an explicit or implicit underlying framework, is certainly of relevance in some countries.²⁰ However, there are always competing theories (as examined for accounting by Watts and Zimmerman, 1979). It is suggested here that the degree of acceptance of particular accounting theories within a country *depends upon* other factors, such as the strength of equity markets and the regulatory system.

Results Rather Than Causes

Some factors above have been seen as more results than causes of the major accounting differences. Similarly, the age and size of the accountancy professions (Factor 7) differ substantially around the world,²¹ but this is likely to be the *result* of different accounting systems. For example, the comparatively small size of the German auditing profession seems to result from the comparatively small number of audited companies, which in turn results from comparative weakness of equity markets.

Factors More Relevant Outside the Developed World

Certain other factors might not discriminate between developed Western countries, on which most classifications have concentrated. For example, political systems (Factor 15), religion (Factor 16) and stage of economic development (Factor 8) are probably sufficiently homogeneous in these countries that they do not have major explanatory power. They might well be relevant for a broader study, and at levels of classification below the two major classes. For example, religion may have an effect on accounting in some countries (Gambling and Abdel-Karim, 1991; Hamid *et al.*, 1993). Of course, religion and culture may be closely related.

²⁰ For example, the Netherlands is often said to have been influenced by the current value theories of Limperg and the German business economist Schmidt (Zeff *et al.*, 1992; Clarke and Dean, 1990).

²¹ For example, see Table 1.1 in Nobes and Parker (1995).

Accidents

Close examination of accidents (Factor 17) will generally reveal their causes. However, certainly at the level of detailed accounting practices within a class, 'accident' may be a useful summary explanation. For example, some of the largest differences between U.S. and U.K. accounting (LIFO, deferred tax and goodwill) could be said to have accidental causes.²² However, it is not necessary to resort to 'accidents' as an explanation of the difference between Class A and Class B accounting. It is suggested that the model which is restated in more detail below is powerful enough without this feature. In the end the validity of this claim is an empirical matter.

Summary on Excluded Factors

Many of the factors which have been examined in this section may be contributory causes to accounting differences or may be *associated* with accounting differences. However, it has been suggested that each can be eliminated as a major reason for the differences identified at the first split of accounting systems into two classes. At lower levels in a classification, many of these factors may be useful explanations of relatively small differences between systems. Further, some of the factors, certainly 'culture', help to explain the different types of capital markets which, according to proposals here, do explain the major groupings.

THE PROPOSED MODEL

The proposed model consists of a number of linked constructs which will be expressed as propositions. Part of the model can be expressed in simplified form as in Figure 2, which amends DS's proposal (summarised in Figure 1). The variables needed have been introduced in the text above, but now need to be marshalled.

The first variable is the type of country culture and the second is the strength of the equity-outsider financing system. This article assumes that some cultures lead to strong equity-outsider markets, and others do not. However, this is an issue for economists and others and is not examined in detail here. The point of departure for the constructs and hypotheses explained below is the second variable: the nature of the equity markets. Suggestions have been made here about how empirical researchers could measure this variable, perhaps leading to a 0/1 (weak or strong equity-outsider market) classification.

A further variable is the type of company. For most companies (insider companies), a controlling stake is in the hands of a small number of owners. For a

FIGURE 2

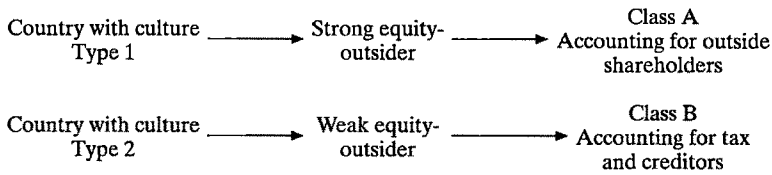
SIMPLIFIED MODEL OF REASONS FOR INTERNATIONAL ACCOUNTING DIFFERENCES



²² This is examined by Nobes (1996), where it is suggested that timing is a key factor. For example, the U.S. requirement to amortize goodwill was introduced earlier than U.K. standard setting on this issue, when goodwill was far less significant.

FIGURE 3

APPLICATION OF FIGURE 2 TO CULTURALLY SUFFICIENT COUNTRIES



comparatively few companies (outsider companies), control is widely spread amongst a large number of 'outsider' equity-holders. Countries with strong equity-outsider systems generally have a large number of outsider companies which may comprise most of a country's GNP, but other countries may also have a few of these companies.

The fourth variable is the country's degree of cultural self-sufficiency. As discussed earlier, some countries have strong indigenous cultures whereas others have imported cultures which are still dominated or heavily influenced from outside. This dichotomy will be expressed by using the labels CS (for culturally self-sufficient) and CD (for culturally dominated). Researchers might wish to measure this in various ways, for example by the number of decades since a country gained political independence from another. Many developing countries are CD and many developed countries are CS, but there are exceptions. Again, the boundaries between CS and CD are unclear, but researchers should have little difficulty in classifying many countries. Concentration should be placed on aspects of business culture in cases where this may give a different answer from other aspects of culture.

The final variable is the type of financial reporting system (or, in short, 'accounting system') introduced earlier as Class A or Class B. Again, preliminary suggestions have been made about how researchers might measure and classify systems in this way.

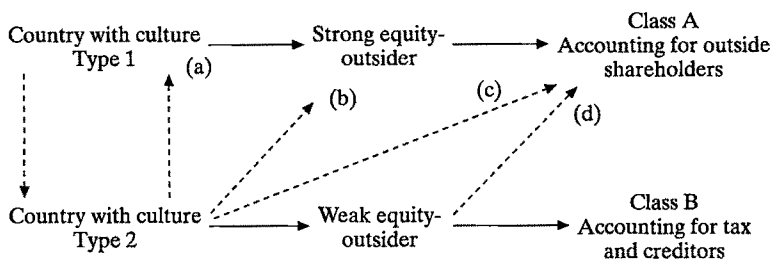
The theoretical constructs which link these variables can now be brought together. It is relevant here to repeat the point that more than one accounting system can be used in any particular country at any one time or over time.

The model can be expressed in terms of propositions, which are then explained and illustrated:

- P1: The dominant accounting system in a CS country with a strong equity-outsider system is Class A.
- P2: The dominant accounting system in a CS country with a weak (or no) equity-outsider system is Class B.
- P3: A CD country has an accounting system imported from its dominating country, irrespective of the strength of the CD country's equity-outsider system.
- P4: As a country establishes a strong equity-outsider market, its accounting system moves from Class B to Class A.
- P5: Outsider companies in countries with weak equity-outsider markets will move to Class A accounting.

FIGURE 4

A PROPOSED MODEL OF REASONS FOR INTERNATIONAL ACCOUNTING DIFFERENCES



The analysis can begin with culturally self-sufficient (CS) countries (Propositions P1 and P2 above), as illustrated in Figure 3. For these countries, it is suggested that the class of the dominant accounting system will depend upon the strength of the equity-outsider market (or on its strength in the past, if there is inertia). Strong equity-outsider systems will lead to Class A accounting (see Table 4), whereas others will lead to Class B accounting. As explained earlier, the term 'dominant accounting system' is used to refer to the type used by enterprises representing the majority of a country's economic activity. For example, small unlisted enterprises in strong equity market countries might not practise Class A accounting or indeed any financial reporting at all.

Propositions P3 to P5 are now examined. Proposition P3 is that, in culturally dominated (CD) countries, accounting systems are imported. Sometimes a CD country will also have had time to develop the style of equity market associated with the culture. Therein, Propositions P1 or P2 will hold as in CS countries. However, sometimes a CD country may have imported its culture and its accounting system without establishing the related equity market. In this case the accounting system will seem inappropriate for the strength of the equity-outsider financing system. Proposition P4 is that, if either a CS or a CD country with a traditionally weak equity market gradually develops a strong equity-outsider system, a change of accounting towards Class A will follow. Also (P5), in a country with weak equity-outsider markets, there may be *some* 'outsider companies' (as defined earlier). Commercial pressure will lead these companies towards Class A accounting, even if the dominant system in the country is Class B. For such a company, there will be rewards in terms of lower cost of capital²³ from the production of Class A statements, particularly if there is an international market in the company's shares. If legal constraints hinder movement towards Class A accounting, then the company can use extra disclosures or supplementary statements.

Figure 4 shows some aspects of these constructs. The continuous arrows are those from Figure 3. Dotted arrows (a) and (c) concern aspects of Proposition P3.

²³ It is argued that equity investors and lenders will be persuaded to provide funds at lower returns to companies using more accepted, familiar and transparent financial reporting (see Botosan, 1997).

Arrow (b) relates to Proposition P4, and Arrow (d) Proposition P5. Some illustrations are:

- 1 (Arrow a) New Zealand is a CD country with wholesale importation of British culture and institutions (Type 1), including a strong equity-outsider system and Class A accounting. Whether the Class A accounting results from the equity market or from direct cultural pressure is not important to the model; it probably arises from both.
- 2 (Arrow b) China is a country without a strong equity-outsider tradition but which seems to be moving towards such a system. Class A accounting is following (Davidson *et al.*, 1995).
- 3 (Arrow c) Malawi is a CD country with very weak equity markets²⁴ but where the accountancy profession has adopted Class A accounting, consistent with its colonial inheritance from the U.K.
- 4 (Arrow d) The Deutsche Bank, Bayer and Nestlé are companies from countries with traditionally weak equity markets. These companies are now interested in world equity-outsider markets, so they are adopting²⁵ Class A accounting for their group accounts.

IMPLICATIONS FOR CLASSIFICATION

Discussions about the reasons for international differences in financial reporting are clearly related to the topic of classification of financial reporting 'systems'. Some implications of the above suggestions for classification researchers are examined here.

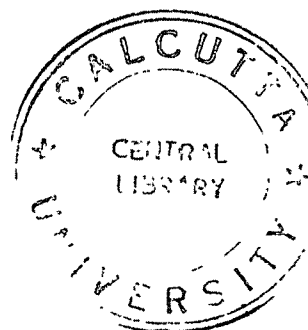
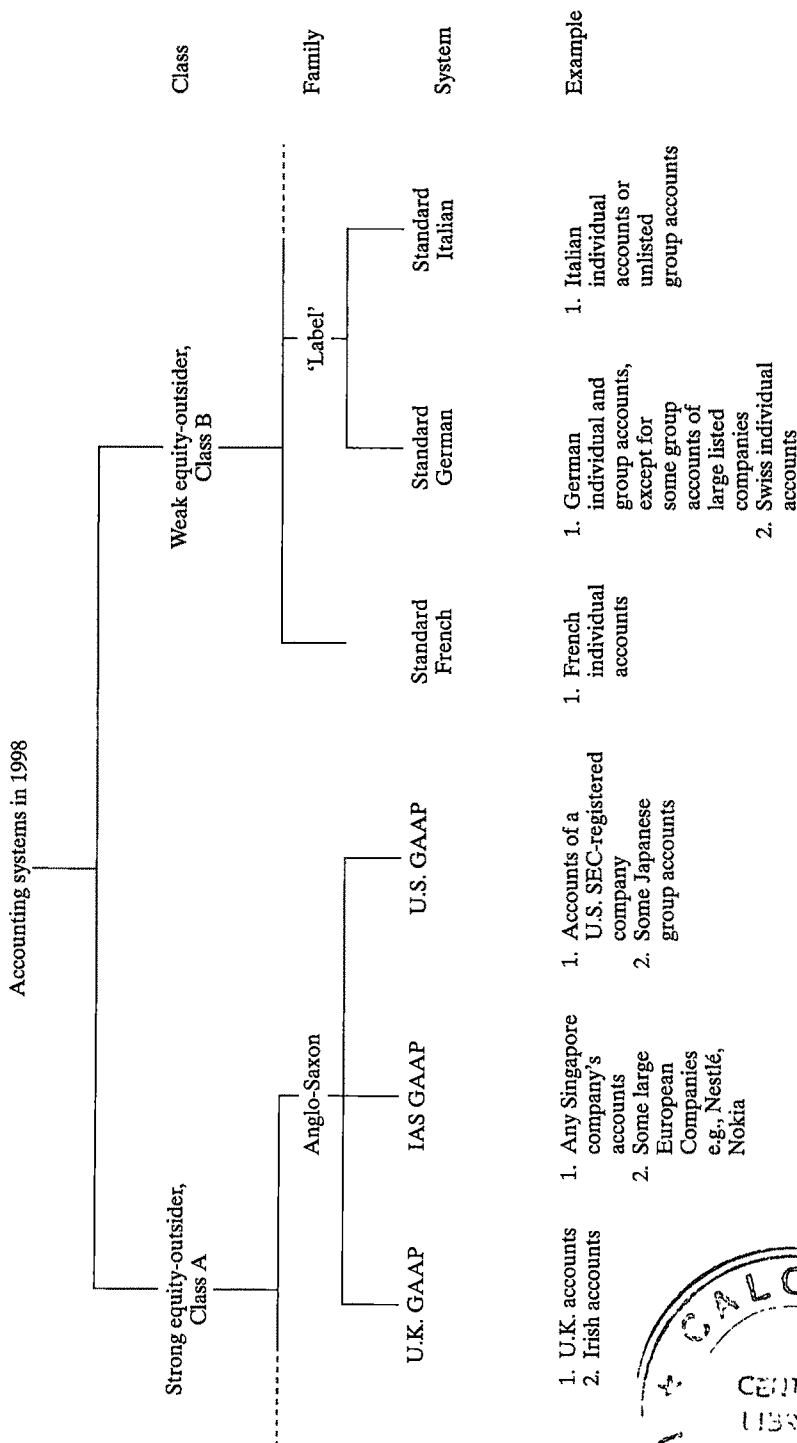
Before Darwin, the Linnaean classification was drawn up on the 'intrinsic' basis of observations about the 'essential' differences in the characteristics of species. Later, genetic and inheritance ('extrinsic') issues became the normal basis for classification, but largely came to the same conclusions. In accounting, one may also see both intrinsic and extrinsic classifications (Roberts, 1995), which may lead to similar conclusions. For example, one can extrinsically trace modern U.K. and modern New Zealand accounting back to a common ancestor; and one can intrinsically note many similarities in the accounting systems currently used. However, it is proposed here to discuss the classifications based on intrinsic factors. For this reason, the term 'species', to which Roberts (1995) objected, will be omitted.

It is not proposed here to re-work previous classifications but to suggest implications of the above conclusions for future classification work. Taking the classification by Nobes (1983), some improvements can be suggested, as shown in Figure 5. The two classes are shown, much as in the earlier classification, but the labels are sharper, following Propositions P1 and P2 above. The bottom level of classification is now a 'system' not a country. This accommodates P5 above. In order to make

²⁴ These issues are discussed by Nobes (1996).

²⁵ For example, Bayer adopted international accounting standards (IASs) for its group accounts for 1994, and Deutsche Bank produce supplementary IAS group accounts for 1995. Nestlé published IAS group accounts.

FIGURE 5
EXTRACT FROM PROPOSED SCHEME FOR CLASSIFICATION



the classification easier to use, the systems could be labelled (e.g., U.S. GAAP). The classification in Figure 5 is by no means complete, for it merely seeks to illustrate the type of amendments proposed for future classifiers.

Below each system, there are examples of users of the system. This accommodates the points made earlier about the meaning of the term 'dominant accounting system'. For instance, U.S. GAAP is used by SEC-registered companies but not by all U.S. companies. Similarly, some Japanese companies are allowed to follow U.S. GAAP for their group accounts for both U.S. and Japanese purposes. As another instance, the 'standard German' system is that used by German companies for individual company accounts and, by most of them, for group accounts. However, several German listed companies are now publishing group accounts in accordance with International Accounting Standards, either by carefully choosing unusual German options (e.g., Bayer for 1994) or by producing two sets of group accounts (e.g., Deutsche Bank for 1995).

Proposition P3 would be relevant for the inclusion of developing countries in a classification. The fourth proposition could be used to predict which countries would move their dominant systems towards Class A in the classification.

POLICY IMPLICATIONS FOR RULE-MAKERS

The import and export of accounting technology (Parker, 1989) seems to be accelerating as a result of globalization and the formation of economic blocs such as the European Economic Area and the North American Free Trade Area. Also, the World Bank has funded advice for China on reforming its accounting; the British Foreign Office for Romania; the European Union for Russia; and so on. This section examines some implications of the article's earlier sections for standard-setters and other rule-makers.

In a CD country, the rule-makers should note that the country's accounting system is likely to have been imported and may not be appropriate for the main purpose of accounting. For example, in a developing country with imported Class A accounting but with few or no listed companies, the paraphernalia of Class A (e.g., extensive disclosure, consolidation, external audit) may be an expensive luxury. Resources might be better spent on establishing a reliable and uniform bookkeeping system, partly for the purpose of improving the collection of tax.

A similar point applies to many former communist countries, where the introduction of Class A accounting for a large proportion of enterprises might be inappropriate. However, for some such countries (perhaps China) where an impression has been created that the population and the government seem keen on moving to an equity-outsider system, the introduction of Class A might be appropriate, at least for large or listed companies.

In CS countries with a credit-insider system, again the rule-makers should think carefully before a generalized introduction of Class A. For example, it is not at all clear that the benefits of Class A would exceed its cost for the bulk of German companies. It is also not clear that there would be much benefit in any improved ability to compare corner grocery shops in Stuttgart with those in Sydney. However,

German rule-makers should ask themselves (and are doing so) whether they should assist the large German companies who are being forced by commercial pressures towards Class A. One approach would be exemption from normal German rules for the preparation of consolidated financial statements by such companies.

There is another policy question for governments whose countries do not have equity-outsider financing systems but who wish to encourage them. Would the imposition of a Class A financial reporting system encourage a change in financing system? The thrust of this article is that the financial reporting *follows* from the financing system. This is reminiscent of the debate in the literature about the relationship between double-entry bookkeeping and the rise of capitalism (e.g., Sombart, 1924; Yamey, 1949; Yamey, 1964; Winjum, 1971). The weight of argument seems to rest with those who believe that double entry follows business developments rather than leading them. None of this proves that developments in accounting cannot assist in economic development. However, the *imposition* of Class A might be inappropriate, particularly if done for unlisted companies or within a detailed and slow-moving legal system, given that an important feature of Class A accounting is that it can adapt to commercial circumstances. It might be better to concentrate on making Class A *available* by removing any legal or economic barriers to its usage and by subsidizing education.

In CS countries with equity-outsider financing systems and Class A accounting, the rule-makers should ask whether the full panoply of Class A is necessary for smaller companies or whether a separate financial reporting system should be allowed for them. This issue has largely been resolved in the U.S.A., as discussed earlier, and recent moves in the U.K. have exempted some smaller companies from audit and from the disclosure rules of several standards.²⁶

The International Accounting Standards Committee (IASC) does not impose its rules on any enterprises; it merely makes them available to companies or regulators. However, some regulators impose IASs on some or most enterprises in their countries.²⁷ Also, the World Bank requires its borrowers to use IASs. The IASC should consider whether it could make available some additional 'system' which might be more suitable for financial reporting by unlisted companies.

SUMMARY

This article proposes a general model of the reasons for international differences in accounting practices. Instead of dozens of potential independent variables, it proposes two explanatory factors for the first split of accounting systems into classes. For culturally self-sufficient countries, it is suggested that the class of the pre-dominant accounting system depends on the strength of the equity-outsider market.

²⁶ In 1994, the audit requirement was removed or reduced for private companies with turnover under £350,000. The Accounting Standards Board published an exposure draft for a Financial Reporting Standard for Smaller Entities in 1996.

²⁷ This is approximately the position for Singapore, Hong Kong, and many other Commonwealth countries.

For culturally dominated countries, the class of the accounting system is determined by the cultural influence. However, sometimes an equity-outsider market may gradually develop, or certain companies may be interested in foreign equity markets. This will lead to the development of the appropriate accounting, and it is one of the reasons for the existence of more than one class of accounting in one country.

Many other factors, which had been suggested previously as reasons for accounting differences, result from or are linked to the equity market. Some factors are perhaps reasons for the differences in equity markets, but are too unclear to measure with any precision. A general theory previously proposed by Doupnik and Salter (1995) mixed several of these factors and mis-specified some of them.

Some improvements to the classification of accounting systems have been suggested, incorporating the idea that it is accounting practice systems, not countries, that should be classified. Some implications for rule-makers are suggested, warning against inappropriate transfers of technology.

REFERENCES

- Baydoun, N., and R. Willett, 'Cultural Relevance of Western Accounting Systems to Developing Countries', *Abacus*, March 1995.
- Beaver, W. H., *Financial Reporting: An Accounting Revolution*, Prentice-Hall, 1989.
- Belkaoui, A., *International Accounting*, Quorum, 1995.
- Botosan, C. A., 'Disclosure Level and the Cost of Equity Capital', *Accounting Review*, July 1997.
- Briston, R. J., 'The Evolution of Accounting in Developing Countries', *International Journal of Accounting*, Fall 1978.
- Briston, R. J., and Foo See Liang, 'The Evolution of Corporate Reporting in Singapore', *Research in Third World Accounting*, Vol. 1, 1990.
- Cable, J., 'Capital Market Information and Industrial Performance: The Role of West German Banks', *Economic Journal*, March 1985.
- Choi, F. D. S., and G. G. Mueller, *International Accounting*, Prentice-Hall, 1992.
- Chow, L. M., G. K. Chau and S. J. Gray, 'Accounting Reforms in China: Cultural Constraints on Implementation and Development', *Accounting and Business Research*, Vol. 26, No. 1, 1995.
- Clarke, F. L., and G. W. Dean, *Contributions of Limpberg and Schmidt to the Replacement Cost Debate in the 1920s*, Garland, 1990.
- Cooke, T. E., and R. S. O. Wallace, 'Financial Regulation and its Environment: A Review and Further Analysis', *Journal of Accounting and Public Policy*, Summer 1990.
- Da Costa, R. C., J. C. Bourgeois and W. M. Lawson, 'A Classification of International Financial Accounting Practices', *International Journal of Accounting*, Spring 1978.
- David, R., and J. E. C. Brierley, *Major Legal Systems in the World Today*, Stephens, 1985.
- Davidson, R. A., A. M. G. Gelardi and F. Li, 'Analysis of the Conceptual Framework of China's New Accounting System', *Accounting Horizons*, March 1995.
- Doupnik, T. S., and S. B. Salter, 'External Environment, Culture, and Accounting Practice: A Preliminary Test of a General Model of International Accounting Development', *International Journal of Accounting*, No. 3, 1995.
- Federation of European Stock Exchanges, *Share Ownership Structure in Europe*, 1993.
- Frank, W. G., 'An Empirical Analysis of International Accounting Principles', *Journal of Accounting Research*, Autumn 1979.

INTERNATIONAL DIFFERENCES IN FINANCIAL REPORTING

- Franks, J., and C. Mayer, 'Corporate Control: A Synthesis of the International Evidence', working paper of London Business School and University of Warwick, 1992.
- Gambling, T., and R. A. A. Abdel-Karim, *Business and Accounting Ethics in Islam*, Mansell, 1991.
- Gernon, H., and R. S. O. Wallace, 'International Accounting Research: A Review of its Ecology, Contending Theories and Methodologies', *Journal of Accounting Literature*, Vol. 14, 1995.
- Gonzalo, J. A., and J. L. Gallizo, *European Financial Reporting: Spain*, Routledge, 1992.
- Gordon, P. D., and S. J. Gray, *European Financial Reporting: United Kingdom*, Routledge, 1994.
- Gray, S. J., 'Towards a Theory of Cultural Influence on the Development of Accounting Systems Internationally', *Abacus*, March 1988.
- Hamid, S. R., R. Craig and F. L. Clarke, 'Religion: A Confounding Cultural Element in the International Harmonization of Accounting?', *Abacus*, September 1993.
- Harrison, G. L., and J. L. McKinnon, 'Culture and Accounting Change: A New Perspective on Corporate Reporting Regulation and Accounting Policy Formulation', *Accounting, Organizations and Society*, No. 3, 1986.
- Hofstede, G., *Culture's Consequences: International Differences in Work-Related Values*, Stage Publications, 1980.
- Hove, M. R., 'Accounting Practice in Developing Countries: Colonialism's Legacy of Inappropriate Technologies', *International Journal of Accounting*, Fall 1986.
- Jensen, M. C., and W. H. Meckling, 'Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure', *Journal of Financial Economics*, October 1976.
- Kenway, P., 'The Concentration of Ownership and its Implications for Corporate Governance in the Czech Republic', University of Reading, Discussion Papers in Economics, Series A, No. 288, 1994.
- Lamb, M., C. W. Nobes and A. D. Roberts, 'The Influence of Taxation on Accounting: International Variations', Reading University Discussion Papers, 1995.
- La Porta, R., F. Lopez-de-Silanes, A. Shleifer and R. W. Vishny, 'Legal Determinants of External Finance', *Journal of Finance*, July 1997.
- Meek, G., and S. Saudagaran, 'A Survey of Research on Financial Reporting in a Transnational Context', *Journal of Accounting Literature*, No. 9, 1990.
- Miller, M. C., 'Australia', in T. E. Cooke and R. H. Parker (eds), *Financial Reporting in the West Pacific Rim*, Routledge, 1994.
- Nair, R. D., and W. G. Frank, 'The Impact of Disclosure and Measurement Practices on International Accounting Classifications', *Accounting Review*, July 1980.
- Nobes, C. W., 'An Empirical Analysis of International Accounting Principles: A Comment', *Journal of Accounting Research*, Spring 1981.
- , 'A Judgmental International Classification of Financial Reporting Practices', *Journal of Business Finance and Accounting*, Spring 1983.
- , Ch. 1 in C. W. Nobes and R. H. Parker (eds), *Issues in Multinational Accounting*, Philip Allan, 1988.
- , 'Classification of Accounting Using Competencies as a Discriminating Variable: A Comment', *Journal of Business Finance and Accounting*, January 1992.
- , 'Corporate Financing and its Effect on European Accounting Differences', Reading University Discussion Papers, 1995.
- , *Compliance with International Standards*, UNCTAD, 1996.
- Nobes, C. W., and R. H. Parker (eds), *Comparative International Accounting*, Prentice-Hall, 1995.
- Parker, R. H., 'Importing and Exporting Accounting: The British Experience', in A. G. Hopwood (ed.), *International Pressures for Accounting Change*, Prentice-Hall, 1989.
- Parry, M., and R. Grove, 'Does Training More Accountants Raise the Standards of Accounting in Third World Countries? A Study of Bangladesh', *Research in Third World Accounting*, Vol. 1, 1990.

- Radebaugh, L. H., 'Environmental Factors Influencing the Development of Accounting Objectives, Standards and Practices in Peru', *International Journal of Accounting*, Fall 1975.
- Radebaugh, L. H., and S. Gray, *International and Multinational Enterprises*, Wiley, 1993.
- Rahman, A., H. Perera and S. Ganesanandam, 'Measurement of Formal Harmonization in Accounting: An Exploratory Study', *Accounting and Business Research*, Autumn 1996.
- Roberts, A. D., 'The Very Idea of Classification in International Accounting', *Accounting, Organizations and Society*, Vol. 20, Nos 7/8, 1995.
- Scheid, J.-C., and P. Walton, *European Financial Reporting: France*, Routledge, 1992.
- Schweikart, J. A., 'Contingency Theory as a Framework for Research in International Accounting', *International Journal of Accounting*, Fall 1985.
- Shoenthal, E., 'Classification of Accounting Systems Using Competencies as a Discriminating Variable: A Great Britain-United States Study', *Journal of Business Finance and Accounting*, Autumn 1989.
- Soeters, J., and H. Schreuder, 'The Interaction between National and Organizational Cultures in Accounting Firms', *Accounting, Organizations and Society*, Vol. 13, No. 1, 1988.
- Sombart, W., *Der Moderne Kapitalismus*, 6th edn, Duncker & Humblot, Vol. 2.1, 1924.
- Standish, P. E. M., 'Origins of the *plan comptable général*: A Study in Cultural Intrusion and Reaction', *Accounting and Business Research*, Autumn 1990.
- , 'Financial Reporting in France', Ch. 11 in C. W. Nobes and R. H. Parker (eds), *Comparative International Accounting*, Prentice-Hall, 1995.
- Tweedie, D. P., and G. Whittington, *The Debate on Inflation Accounting*, Cambridge University Press, 1984.
- Wallace, R. S. O., and H. Gernon, 'Frameworks for International Comparative Financial Accounting', *Journal of Accounting Literature*, Vol. 10, 1991.
- Watts, R., and J. Zimmerman, 'The Demand for and Supply of Accounting Theories: The Market for Excuses', *Accounting Review*, April 1979.
- Winjum, J. O., 'Accounting and the Rise of Capitalism: An Accountant's View', *Journal of Accounting Research*, Vol. 9, 1971.
- Yamey, B. S., 'Scientific Bookkeeping and the Rise of Capitalism', *Economic History Review*, 2nd ser, Vol. 1, 1949.
- , 'Accounting and the Rise of Capitalism: Some Further Notes on a Theme by Sombart', *Journal of Accounting Research*, II, 1964.
- Zeff, S. A., F. van der Wel and K. Camfferman, *Company Financial Reporting: A Historical and Comparative Study of the Dutch Regulatory Process*, North-Holland, 1992.
- Zysman, J., *Government, Markets and Growth: Financial Systems and the Politics of Industrial Change*, Cornell University Press, 1983.

APPENDIX

This appendix contains an example (relating to 1995) of the measures that could be used to distinguish between strong equity markets and others. The data in Table A relate to the eight largest economies in Europe, which are probably all CS countries.

TABLE A
EQUITY MARKET MEASURES

	Domestic equity market capitalization/GDP	Domestic listed companies per million of population
U.K.	1.34	30.2
Netherlands	0.99	14.4
Sweden	0.76	24.4
Belgium	0.50	14.3
France	0.40	12.4
Spain	0.36	9.3
Germany	0.31	8.4
Italy	0.18	4.3

Sources: European Stock Exchange Statistics, Annual Report 1995, Federation of European Stock Exchanges; and Pocket World in Figures 1995, The Economist.

In order to identify a Category IV financing system, it would also be necessary to establish that strong equity markets (e.g., U.K. and Netherlands) had a high level of 'outsiders'. This could be done using statistics of ownership of shares (e.g., Federation of European Stock Exchanges, 1993).

PAUL A. GRIFFIN

Further Evidence on the Economic Effects of Changes in Loan Loss Provisions on Bank Stock Returns

This article examines the loan loss disclosures made by seventeen New England banks during 1989 and 1990 and provides evidence of a differential market reaction based on the timeliness of the announcement relative to the end of a fiscal quarter. Unanticipated increases in loan loss provisions reported early in the quarter caused the average New England bank's stock price to drop by almost 5 per cent compared to less than a 1 per cent drop for banks that announced late. Also, the price reaction varied with the magnitude of the unexpected change in the provision, and this too was more negative for the early announcers. These results are broadly consistent with a stock market that uses timely sources of information about loan impairment, including information in published financial statements.

Key words: Banks; Disclosure; Loan losses; Market prices; Timing.

The measurement and disclosure of information about the impairment of a bank's loan portfolio have been the subject of considerable debate in the United States and elsewhere. Of key concern has been how and when a bank should recognize and report the provision for loan losses,¹ an accounting event that can substantially affect reported net income and shareholders' equity.² This article addresses three questions. First, how does the stock market react to news of a loss in a bank's loan portfolio? Second, does this reaction depend on the amount of change in reported

¹ U.S. Banks are currently influenced by Statement of Financial Accounting Standards (SFAS) No. 5, *Accounting for Contingencies*; SFAS No. 15, *Accounting by Debtors and Creditors for Troubled Debt Restructurings*; SFAS No. 118, *Accounting by Creditors for Impairment of a Loan*; SEC Financial Reporting Release No. 28, *Accounting for Loan Losses by Registrants Engaged in Lending Activities*; SEC Guide No. 3 on supplemental disclosures on non-performing and other loan categories; and other publications such as the AICPA Audit and Accounting Guide, *Audits of Banks (1984)* and *Statements of Position* amending this guide.

² Regulatory capital may also be affected. During the study period, banks were subject to two sets of FDIC guidelines. Under the first, regulatory capital is affected only by the tax effects of the loan loss provision, since the allowance account is added back to shareholders' equity in computing 'primary' capital. In 1989 the FDIC issued new risk-based capital guidelines, which were fully implemented in 1992. Under these rules, regulatory capital is affected because the loan loss allowance is not added back to equity in computing Tier 1 risk-based capital.

PAUL A. GRIFFIN is Professor of Management, University of California, Davis.

This article has benefited from comments by Brad Barber, John Lyon, participants at the University of Southern California accounting workshop, and three anonymous reviewers. The research has been partially supported by a grant from the University of California, Davis.

quarterly earnings that occurs as a result of the loan loss? Finally, does this reaction depend on when in the fiscal quarter the bank makes the announcement?

To address these questions, the stock market reaction to changes in quarterly loan loss provisions is examined for a sample of New England banks. This sample is used in the belief that the economic context in which banks operate and report their loan loss provisions matters. As such, the results in this study may offer a deeper understanding of the previous research, much of which has used large samples and extended time periods to study aggregate hypotheses. The approaches in earlier work can obscure important regional or other contextual differences, potentially important in the regulated U.S. banking industry. Moreover, previous research has produced conflicting results.

For example, several studies have documented a positive reaction to announcements of loan loss provisions in response to the 1987 international debt crisis (Musimeci and Sinkey, 1990; Griffin and Wallach, 1991), and to loan provisions more generally, after holding constant other information such as non-performing loans, loans written off, and operating cash flows (Beaver *et al.*, 1989; Wahlen, 1994). For the most part, these results have been interpreted in a signalling framework, wherein managers use the loan loss provision to convey favourable news about the bank's financial strength, bargaining power, reputation or future cash flows. Conversely, others have documented a negative relation between increases in loan loss provisions and stock market prices, emphasizing the valuation effects of the unanticipated loan loss information for banks in general (Liu and Ryan, 1995) and regional banks in particular (Docking *et al.*, 1997).

But if context matters, the preceding results may not generalize to all banks and time periods. Hence, this study examines a reasonably homogeneous sample of banks—homogeneous in that, at the time of their loan loss disclosures, each bank operated in the same regulatory environment, followed comparable reporting policies, and experienced similar economic conditions. Specifically, the loan loss announcements made by a sample of seventeen New England banks during 1989–90 are examined. This limited sample is used because the banks' loan portfolios during 1989–90 were affected by similar, deteriorating conditions. Also, the banks disclosed their loan loss information in a generally consistent manner, for example, they made no earlier, separate quarterly write-offs or disclosures about the non-performing status of their loans. Additionally, the changes in loan loss levels for New England banks from 1988 to 1989 far outstripped that of any other state or region for the same period.³ The market responses to loan impairment information for a sample of New England banks during this period should thus be both uniform and significant.

Second, the study examines the transfer of information across banks by considering the timing of each bank's results within the sequence of loan loss announcements around the end of each fiscal quarter. If information transfer occurs, banks

³ FDIC data, for instance, show that the ratio of change from 1988 to 1989 in banks' provision for loan losses and leases to loans and leases, net, was 2.46 per cent for all New England banks, 3.45 per cent for Connecticut (the worst U.S. state), and 2.76 per cent for Massachusetts versus 0.72 per cent for the U.S. economy as a whole (FDIC *Statistics on Banking*, 1988–90).

that report loan loss information early, either separately or as part of an earnings announcement, should convey more information about loan impairment than similar banks that report on a less timely basis, especially when the banks operate in a similar environment (in this case, the New England region). Banks that report on a less timely basis should also be affected at the time the early banks make their announcements.⁴

This study hypothesizes and finds a significant negative market reaction to the information in the loan loss announcements. In particular, the average New England bank share price falls on the day of a loan loss announcement; the negative price reaction is greater when the bank discloses early versus late relative to the end of the fiscal quarter; and the reaction varies according to the amount of the unexpected decrease (increase) in pre-tax earnings caused by the increase (decrease) in the loan loss provision. These results suggest that the homogeneity of the sample, the relative timing of the information within a quarter and other conditioning factors do indeed matter in understanding how the stock market responds to loan loss information.

The notion that conditioning factors are important in studying the price effects of loan loss information is also supported by other recent studies. For example, Docking *et al.* (1997) hypothesize and report that U.S. regional banks are more negatively affected by increases in loan loss provisions than are money centre banks, arguing that the former are relatively less followed by financial analysts. Also, Beaver and Engel (1996) report that market prices are lower for banks whose loan loss provisions are more likely to be non-discretionary rather than discretionary.⁵

RESEARCH DESIGN

The results are based on estimates of the reaction of a bank's stock price to a change in the loan loss provision. These estimates control for other factors that

⁴ Information transfer can be significant in the banking sector not only because of the relatively standardized nature of the information but also because of a common 31 December fiscal year end. The evidence supports this view. For example, Slovin *et al.* (1992) indicate that banks convey significantly more information relevant to other banks than firms in the industrial sector convey about other industrial firms; Elliott *et al.* (1991) document the transfer of information across banks by measuring the price effects of two announcements by leading banks Citicorp and Bank of Boston on other banks, and find significant positive effects only for money centre banks; Freeman and Tse (1992) also present evidence of information transfer for the banks in their sample (two digit SIC = 60). These earlier studies, while documenting information transfer generally, do not examine the specific effects of differences in the timing in bank disclosures within a fiscal quarter.

⁵ Liu *et al.* (1997), extending this research, hypothesize and find that banks are more likely to report non-discretionary (discretionary) components in the first through third (fourth) quarters of a fiscal year. Based on market prices from the beginning of a quarter until the earnings announcement date for that quarter, the study reports that the market responds negatively to unexpected loan loss provisions in all the quarters, except the response in the fourth quarter is negative for only those banks with low primary capital. The authors posit that the market learns earlier about the loan problems at these banks; so that it more likely views their fourth quarter loan loss increases as positive signals that the loan problems are being resolved.

might account for a change in stock price at the time of disclosure of the loan loss information, such as other earnings-related information and industry factors including other banks' loan loss provisions. In an informationally efficient market, stock prices should reflect this information; and thus market responses are the result of the unexpected component of an 'information variable'. The methodology in this study assumes that investors develop expectations about a bank's loan loss provision and other earnings variables considering (a) the bank's previous loan loss disclosures, (b) similar banks' disclosures relevant to the bank in question (e.g., change in other banks' loan provision) and (c) information in bank stock prices generally (e.g., industry-wide factors). The market reaction to the unexpected component of a loan loss announcement is based on the common stock return at the time investors could have first responded to the information.⁶

Models and Variables

The market reaction is estimated by regressing banks' daily returns from 2 January 1989 to 30 June 1990 on an index of bank stock returns, a measure of the unexpected change in the loan loss provision and other earnings information for the same period. First, the day of announcement of quarterly loan loss or other earnings information is obtained from either the *Dow Jones News Wire* service (which pinpoints the exact hour and minute of the announcement) or the *Wall Street Journal* if not reported by the wire service.⁷ These announcements not only include the loan loss provision reported as part of the bank's quarterly financial statements but also the loan loss information in a company release in anticipation of that information (e.g., an announcement of an expected loan loss provision for a quarter). Second, for sequencing purposes, these announcements are allocated to a particular quarter defined to begin one month before and end two months after the completion of the fiscal quarter. Each loan loss announcement is then classified as either early or late in a quarter using two definitions of timeliness. A disclosure is *early* in a quarter if it arrives prior to the median date in the sequence of (say) k announcements in that quarter (definition 1) or if it is one of the first three

⁶ The research design favours using a one-day interval to reduce overlap with other companies' disclosures. This benefits the analysis by minimizing the potential for contemporaneous correlation in the residuals of a regression model relative to the use of a longer interval. The data are also examined using a three-day interval centred on the announcement date (day 0). While a one-day interval reduces overlap, neither interval captures all informational effects since there may be a delayed response to loan loss information similar to the post-announcement drift that has been observed for earnings more generally (Bernard and Thomas, 1990).

⁷ Wire service disclosures made after the close of trading are assigned to the next day. For the thirty-one disclosures not reported on the wire service, the day of disclosure to the market is assumed to be the date of publication of the *Wall Street Journal*. The results, however, are qualitatively the same whether based on all loan loss announcements ($n = 137$) or only those reported on the news wire ($n = 106$). The assumption about the non-wire service disclosures thus appears reasonable.

disclosures in that same quarterly sequence (definition 2). A *late* disclosure arrives after the cut-off date.⁸

To analyse the data, the observations for each bank are then combined into a single data matrix, and a pooled, time-series, cross-sectional regression model is estimated (Judge *et al.*, 1988). This modelling approach enables an examination of the price effects of multiple news items that occur at different and/or common dates for firms in a single industry. Also, the regression model distinguishes between the price effects of early and late announcements and measures these price effects not only as an average change in daily stock price but also as an amount of stock price response per dollar of change in the loan loss provision per share. Each pooled regression contains 6,630 (390 trading days times seventeen firms) daily return and market index observations. However, a loan loss disclosure need not occur on all of these 390 days.

Model (1) below focuses on the average change in stock price on the day of the announcement of either an early or late loan loss announcement. The model is:

$$R_{it} = a + \beta RB_t + \gamma^E \Delta LL_{it}^E + \gamma^L \Delta LL_{it}^L + v_{it} \quad (1)$$

where R_{it} equals the return on bank i for day t , and RB_t is proxied by the percentage daily change in a value-weighted index of approximately 800 NASDAQ-listed bank stocks.⁹ Bank i 's unexpected loan loss provision, ΔLL_{it} , is set equal to 1 for an unexpected loan loss increase, -1 for an unexpected decrease, and 0 if no information is released to the market on day t . ΔLL_{it} is derived from a simple, non-seasonal random walk model, namely, $\Delta LL_{it} = LL_{q_c} - LL_{q_p}$ where LL_{q_c} = the loan loss provision in the current quarter and LL_{q_p} = the loan loss provision from the previous quarter.¹⁰ Each unexpected change in loan loss provision is classified as

⁸ Consider, for example, the following dates for ten loan loss disclosures relating to the fourth quarter 1989 financial results: 5 December 1989, 17 December 1989, 28 December 1989, 15 January 1990, 20 January 1990, 25 January 1990, 30 January 1990, 5 February 1990, 8 February 1990 and 11 February 1990. For sequencing purposes, the quarter would begin on 1 December 1989 and end on 28 February 1990. Under definition 1, the first five dates would be classified as early; under definition 2, only the first three would be classified as early.

⁹ The NASDAQ bank stock index is the broadest available. Fourteen of the seventeen banks are listed on NASDAQ, the others on the NYSE. An alternative index, the Standard & Poor's regional bank stock index, was considered inappropriate as it is based only on sixteen large regional banks (Standard & Poor's *Analyst's Handbook: Official Series*, 1992). Because the inclusion of RB_t biases against finding loan loss effects, I also considered a two-factor regression model using a market return index and change in the yield of a 180-day government bond. The significance of the loan loss coefficients in model (1) declined under this approach.

¹⁰ An alternative is to use a seasonal model to estimate the unexpected loan loss provision, namely, $\Delta LL_{it} = LL_{q_c} - LL_{q_{c-4}}$ where q_{c-4} = the same quarter one year ago. Results from the use of this model are reported later in the article. Clearly, these and other models that depend only on prior values of LL_{it} for a given bank reflect only some of the information the market uses to determine whether a loan loss provision is unexpectedly positive or negative, and may reflect highly imprecise estimates of information content, particularly when ΔLL_{it} is negative, which could occur because of a significant increase in the previous quarter (non-seasonal model) or the same quarter one year ago (seasonal model). Data relevant to this issue are shown in the results section, which documents the market response to all unexpected changes, ΔLL_{it} , and unexpected increases in the loan loss provision, $+\Delta LL_{it}$.

early, ΔLL_{it}^E , or late, ΔLL_{it}^L , according to the previously stated definition of timeliness. Thus, for a given definition, the γ^E and γ^L coefficients in model (1) represent the incremental amount of price change on the day of an early or late loan loss announcement, respectively, after extracting any co-movement in a bank stock index.¹¹

Prior research has cast the loan loss provision as a reflection of both negative information about loan impairment and positive information about financial strength or bargaining power, and so in a general setting the expected signs of γ^E and γ^L are ambiguous. However, the more probable it is that a loss provision announcement provides timely information about changes in a bank's loan impairment status (which should be the case with the New England banks, for reasons already given), and not other factors such as financial strength or bargaining power, the more likely the coefficient of market response, γ , will be negative.¹² An early loan loss announcement in a given quarter increases that likelihood. Hence, the first testable hypothesis is:

- H1: The market reaction to an early loan loss announcement is negative, $\gamma^E < 0$ (H1a) and less than the reaction to a late announcement, $\gamma^E < \gamma^L$ (H1b).

Next, a second model is estimated that incorporates information about the magnitude and timing of an unexpected change in the loan loss provision relative to other information. This model controls for market and industry factors and other earnings-related information available at the time of a quarterly earnings announcement. Other earnings-related information is proxied by the unexpected change in two variables: (a) net interest income (interest revenue minus interest expense) and (b) other income and expenses, including security gains and losses and non-interest income.¹³ While the first variable is relatively free of management discretion or mandated changes in accounting, the second variable is potentially correlated with a bank's unexpected loan provision in that management can adjust other earnings components jointly with the loan provision (Beatty *et al.*, 1995). The second model is:

¹¹ The pooled regression model requires an assumption about whether the v_{it} for each bank are serially and cross-sectionally correlated. While daily stock returns are generally serially uncorrelated, the assumption of zero cross-sectional correlation is questionable in that one bank's announcement on a given day can affect other banks' returns on that same day. Only a portion of the cross-sectional correlation from common economy and banking factors is extracted by including an index of bank returns (RB_t) as an independent variable. So that any remaining cross-sectional correlation is incorporated into the tests, model (1) and model (2) are estimated as a system of seemingly unrelated regression (SUR) equations (Judge *et al.*, 1988) and use the t statistics from the cross-sectional distribution of the SUR coefficients in the significance tests. Another approach is to estimate a fixed-effects model, which *inter alia* specifies a bank-specific intercept term in the pooled regression to address cross-sectional correlation. A fixed effects model is a special case of SUR.

¹² Recall that by multiplying an unexpected loan loss decrease by minus one, model (1) predicts that a favourable change in impairment status will have a negative coefficient.

¹³ The unexpected change is defined similarly to the models for the loan loss provision, that is, as the difference between reported net interest income or other income and expense for the current quarter, q_c , and the same variables last quarter, q_p , or the same quarter one year ago, q_{c-4} . The variable 'other income and expense' is defined as 'net income' less 'net interest income' plus 'loan loss provision'.

$$R_{it} = \alpha + \beta RB_t + \delta^E \Delta LL_{it}^E / P_{it-1} + \delta^L \Delta LL_{it}^L / P_{it-1} + \phi \Delta NII_{it} / P_{it-1} + \eta \Delta OIE_{it} / P_{it-1} + u_{it} \quad (2)$$

where R_{it} and RB_t are defined as in model (1). The variables unexpected early (late) loan loss provision, ΔLL_{it}^E (ΔLL_{it}^L), unexpected net interest income, ΔNII_{it} , and unexpected other income and expenses, ΔOIE_{it} , are all stated on a 'yield basis' by dividing each by the number of shares outstanding as of the end of the current quarter and then deflating by the stock price on the day preceding the loan loss announcement, P_{it-1} . This procedure not only reduces heteroskedasticity in the regression but also makes the loan loss coefficients, δ^E and δ^L , economically interpretable as measures of the responsiveness of the bank's stock price to a dollar (per share) of unexpected change in the loan loss provision.

Consistent with the first hypothesis—that the stock market should react more strongly to timely news about the loan loss provision than untimely news—the second hypothesis asserts that this reaction should be negatively associated with a primary source of that news, namely, loan loss information in the bank's financial statements. Because reaction to an early announcement is less affected by other banks' announcements, this association should be more negative and thus stronger for the early versus the late announcements. Thus:

- H2: The market reaction to an early loan loss announcement is more negatively associated with the amount of change in the loan loss provision than the market reaction to a late loan loss announcement, $\delta^E < \delta^L < 0$.

Model (2) also specifies net interest income and other income and expense as additional explanatory variables. While it is expected that the coefficients for these non-loan loss components of earnings will be significant, that is, $\phi \neq 0$ and $\eta \neq 0$, the signs of the earnings components are ambiguous.¹⁴

Bank Sample

To test the hypotheses, all bank holding companies headquartered in New England with 31 December 1988 assets in excess of \$2.0 billion were selected. Banks below this threshold were excluded because of concern about identifying the necessary loan loss information from either the *Wall Street Journal* or the *Dow Jones News Wire* service. Those excluded were also small in the aggregate relative to the sample banks. For example, the seventeen banks meeting the size criterion comprised 93.87 per cent and 99.2 per cent of the total assets and total loans of all FDIC insured New England banks, respectively (FDIC *Statistics on Banking*, 1989). During the study period, these sample banks operated principally on a regional basis, due mostly to restrictions at the time on interstate banking (and the *New England Regional Compact*, a cooperative arrangement to prevent nationwide

¹⁴ An unexpected decrease in NII_{it} , for example, may be more than offset by an increase in loan securitization (reported elsewhere in the income statement). The sign of the second component, OIE_{it} , which combines different income and expense items, is also unclear. Earlier research on non-banks reports significant positive and negative coefficients for both income and expense items (Hoskins *et al.*, 1986; Lipe, 1986).

BANK LOAN LOSS PROVISIONS AND STOCK RETURNS

TABLE 1

SAMPLE DESCRIPTIVE CHARACTERISTICS

Bank (nos in thousands)	Market capitalization ^a 31/12/1988	Total assets 31/12/1988	Total loans 31/12/1988	Net income 1988	Net income 1989	Loan loss provn 1988	Loan loss provn 1989
1 Fleet/Norstar	\$2,828,983	\$29,052,205	\$19,748,018	\$335,829	\$371,346	\$106,770	\$160,288
2 Shawmut National	1,765,170	28,413,805	18,382,314	242,500	(128,900)	123,900	625,800
3 Bank of Boston	1,577,276	36,060,606	26,457,375	322,262	70,400	144,000	722,000
4 Bank of New England	1,521,322	32,200,427	24,398,891	281,654	(1,113,000)	123,000	1,614,000
5 State Street Bank	948,462	8,371,952	2,178,802	92,348	104,032	15,580	19,420
5 Bay Banks	689,472	9,496,465	7,568,688	88,534	63,144	16,600	74,900
7 Northeast Bancorp	508,582	3,394,315	2,370,329	34,635	632	9,280	71,226
8 Peoples Bank of Connecticut	248,087	6,658,064	5,510,390	36,555	32,461	4,230	31,106
9 UST Corporation	209,332	2,579,112	1,813,993	28,325	28,341	6,761	9,775
10 Multibank Fin.	202,420	2,900,964	2,177,910	26,892	22,338	7,092	19,467
11 Old Stone	196,199	4,439,174	3,673,978	36,350	(20,689)	11,566	35,549
12 Society for Savings	186,428	3,931,528	3,000,302	33,260	46,009	24,905	28,811
13 First Const. Fin.	176,500	2,290,078	1,841,162	19,028	(23,817)	3,084	60,920
14 Peoples Heritage	160,846	2,233,531	1,662,030	21,435	22,795	6,950	12,609
15 Citytrust	159,011	2,600,172	2,113,293	23,638	(84,771)	14,233	100,125
16 Boston Five	88,804	2,353,202	1,953,640	7,332	6,376	9,297	25,853
17 One Bancorp	66,197	2,563,212	2,150,735	533	(144,786)	23,180	155,778
Total	11,533,090	179,538,812	127,001,850	1,631,110	(748,089)	650,428	3,767,627
Maximum	\$2,828,983	\$36,060,606	\$26,457,375	\$335,829	\$371,346	\$144,000	\$1,614,000
Mean	678,417	10,561,107	7,470,697	95,948	(44,005)	38,260	221,625
Median	209,332	3,931,528	2,370,329	34,635	22,338	14,233	60,920
Minimum	66,197	2,233,531	1,662,030	533	(1,113,000)	3,084	9,775

^a Number of common shares outstanding times price per share at 31 December 1988.

reciprocal banking in New England). They were also substantially exposed to the recessionary and real estate problems that hit New England during 1989–90.¹⁵

Table 1 profiles the sample. In terms of 31 December 1988 market capitalization, the seven largest banks ranged from \$2.829 to \$0.509 billion (average \$1.406 billion) and the remaining banks ranged from \$248 to \$66 million (average \$169.3 million). The combined banks' balance sheets showed total assets of \$179.5 billion and total loans outstanding of \$127 billion. Aggregate loan loss provisions increased substantially from \$650 million in 1988 to \$3.767 billion in 1989. By 30 June 1990, the market capitalization of the seventeen banks had declined by 58.36 per cent from \$11.53 billion to \$4.85 billion, compared to a decline in the NASDAQ bank stock price index of 22.9 per cent.

¹⁵ After outperforming U.S. averages throughout much of the 1980s, especially in financial services, technology and defence, New England's economic growth began to slow as early as 1988, as evidenced by housing starts and employment growth, which started in 1988 to decline significantly more than for the U.S. generally (*New England Economic Project*, 1990). It was not until 1989, however, that New England banks began to recognize the changing economic conditions in their balance sheets. Whereas for 1987 and 1988, the loan loss provisions of 276 FDIC-insured New England banks were at similar levels, from 1988 to 1989 the provisions of these 276 banks increased more than five-fold from \$615 million to \$3.7 billion (*FDIC Statistics on Banking*, 1988–90).

TABLE 2

SUMMARY STATISTICS FOR CHANGE IN LOAN LOSS PROVISION

Change in loan loss provision ^{a,b}	Mean	Standard deviation	Median	Max.	Min.	t statistic prob. (mean = 0)	# obs.
All ΔLL_{it}							
1 $\Delta LL_{it}/P_{t-1}$	0.0191	0.9219	0.0015	4.5160	-6.3329	0.8091	137
2 $+\Delta LL_{it}/P_{t-1}$	0.2414	0.7265	0.0206	4.5160	0.0001	0.0037	81
3 $-\Delta LL_{it}/P_{t-1}$	-0.3026	1.0749	-0.0162	-0.0001	-6.3329	0.0397	56
Early ΔLL_{it}							
4 $\Delta LL_{it}^E/P_{t-1}$	-0.0339	0.8324	0.0035	1.2000	-6.3329	0.7420	69
5 $\Delta LL_{it}^E/P_{t-1}$	0.0660	0.2599	0.0168	0.8029	-0.4660	0.2262	24
6 $+\Delta LL_{it}^E/P_{t-1}$	0.1515	0.2659	0.0361	1.1996	0.0001	0.0005	44
7 $+\Delta LL_{it}^E/P_{t-1}$	0.1660	0.2285	0.0757	0.8029	0.0001	0.0109	16
Late ΔLL_{it}							
8 $\Delta LL_{it}^L/P_{t-1}$	0.0746	1.0470	0.0010	4.5160	-5.1180	0.5678	68
9 $\Delta LL_{it}^L/P_{t-1}$	0.0091	1.0087	0.0014	4.5160	-6.3329	0.9238	113
10 $+\Delta LL_{it}^L/P_{t-1}$	0.3483	1.0329	0.0081	4.5160	0.0005	0.0476	37
11 $+\Delta LL_{it}^L/P_{t-1}$	0.2600	0.8036	0.0111	4.5160	0.0003	0.0113	65
ΔLL_{it} By Quarter							
12 Q4-1988	0.0069	0.0474	0.0016	0.1879	-0.0618	0.5315	20
13 Q1-1989	0.0008	0.0323	-0.0003	0.1418	-0.0210	0.9099	23
14 Q2-1989	0.0332	0.1028	0.0010	0.2888	-0.1239	0.1634	21
15 Q3-1989	0.0766	0.2213	0.0206	0.8658	-0.3420	0.1583	19
16 Q4-1989	0.5306	1.2422	0.0274	4.5160	-0.5679	0.0423	26
17 Q1-1990	-0.4817	1.5146	0.0026	0.4348	-6.3329	0.1096	28

^a $\Delta LL_{it}^{(*)}/P_{t-1}$ = unexpected change in quarterly loan loss provision per share (number of common shares as of the end of the current quarter) announced by bank *i* on day *t* for a given partition ($\bullet$) of the sample divided by the price per share on day *t* - 1. The partitions are defined below. $+\Delta LL_{it}$ ($-\Delta LL_{it}$) indicates an unexpected increase (decrease). Unexpected change is defined as the change in loan loss provision relative the previous quarter.

^b Definitions of the partitions ($\bullet$) in $\Delta LL_{it}^{(*)}/P_{t-1}$.

$E_1(L_1)$ = early (late) ΔLL_{it} defined as preceding (following) the median date of the sample of loan loss announcements for a given quarter.

$E_2(L_2)$ = early (late) ΔLL_{it} defined as the first three (all other) news dates of the sample of loan loss announcements for a given quarter.

Table 2 presents summary statistics for various partitions of the loan loss data, defined here as the quarterly unexpected loan loss provision per share, ΔLL_{it} , divided by price per share on the day prior to the disclosure (unexpected loan loss yield). These data represent the 137 loss observations used to estimate the regression models. Of the 137 loan loss announcements, 81 are increases and 56 are decreases. The simple random walk model used to estimate unexpected loan loss is thus biased toward a greater number of loan loss increases than decreases. The mean (median) unexpected increase in loan loss yield is 0.24 (0.02); and the mean (median) decrease is -0.30 (-0.02) [rows 2, 3]. When the first three disclosure dates in the sequence are defined as early (definition 2), 24 are classified as early and 113 as late. For loan loss increases only, the mean loan loss yield of the 65 late announcements (0.26) exceeds the mean of the 16 early announcements (0.17) [rows 7, 11].

Table 2 also shows that the loan loss announcements are spread reasonably evenly over the six quarters (fourth quarter 1988 to first quarter 1990), the maximum and minimum per quarter being twenty-eight and nineteen, respectively. While the median loan loss change is positive for all quarters except for first quarter 1989, the t values in the table indicate that the mean change is significantly positive only in one quarter (fourth quarter 1989). Finally, thirty-eight loan loss announcements occur on days when there is at least one other announcement, and thirty-five represent a second announcement by a bank in a given quarter (usually a pre-earnings announcement of the loan loss provision). These two factors mean that not all 137 loan loss observations are strictly independent; in the former case due to event clustering, and in the latter because the research approach does not update the unexpected loan loss provision as new information (firm- or industry-specific) becomes available in the quarter.¹⁶

EMPIRICAL RESULTS

Price Reaction Tests

Table 3 shows the results of model (1) for different partitions of the loan loss data and the definitions of early and late announcements. The independent variables, ΔLL_{it}^E and ΔLL_{it}^L , reflect the sign of the loan loss information (loan loss increase = 1, loan loss decrease = -1, otherwise 0) in the current quarter relative to the previous quarter.¹⁷ The model is estimated as a pooled, ordinary least squares regression with returns data from 2 January 1989 to 30 June 1990; and the reported t statistics are based on the cross-sectional distribution of seemingly unrelated regression (SUR) coefficients tested against null values of one for β and zero for the other coefficients.¹⁸

For the full sample, the mean stock price change for an early discloser on the day of a loan loss announcement, γ^E , is -1.29 per cent [row 1] and -2.96 per cent [row 2] for timeliness definitions 1 and 2, respectively. For loan loss increases only, the stock price drops even more. For example, for timing definition 2, the mean stock price change, γ^E , of the eighty-one loan loss increases is -4.91 per cent

¹⁶ This may bias the results in favour of not finding a significant price reaction for the late loan loss announcements. See the empirical results section for further discussion.

¹⁷ Results (not reported) based on a second definition of unexpected loan loss information, $\Delta LL_{it} = LL_{it} - LL_{it-4}$, where $it-4$ = the same quarter one year ago, are qualitatively similar though statistically less significant.

¹⁸ The SUR coefficients are estimated using an 'unrestricted' model, which estimates separate coefficients for each explanatory variable for each of the seventeen banks. For each explanatory variable, I then assume that these SUR coefficients comprise independent drawings from a student t distribution ($n = 17$). This approach to hypothesis testing is conservative relative to using a pooled OLS regression approach, which assumes $n = 6,630$ (390 days $\times$ seventeen firms) independent observations. Tables 3 and 4 also report estimated average parameter values based on a pooled OLS regression. These estimates are in essence equivalent to SUR estimates with the restriction that the independent variable coefficients are the same across banks. (The software employed for this purpose uses the 1962 Zellner iterative procedure to estimate the variance-covariance matrix of the disturbances across the banks. See 'proc syslin sur' in SAS/ETS® Users' Guide, Version 5.)

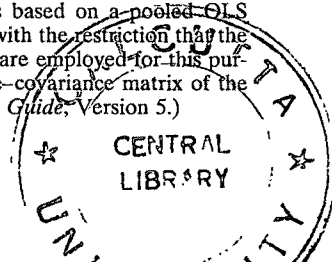


TABLE 3

MARKET RESPONSE TO EARLY VS. LATE LOAN LOSS ANNOUNCEMENTS

Model (1) ^a : $R_{it} = \alpha + \beta RB_t + \gamma^E \Delta LL_{it}^E + \gamma^L \Delta LL_{it}^L + v_{it}$							
# ΔLL_{it} Partition Predicted sign of coefficient	Timing defn ^b	α	β +	γ^E —	γ^L —	Adj. R sq.	# obs. ΔLL_{it} ^c
1 All ΔLL_{it} annmts. <i>t</i> statistics ^d	$E_1(L_1)$	-0.0010	1.1106 (0.99)	-0.0129 (-2.13)**	-0.0071 (-1.22)	0.0320	137
2 All ΔLL_{it} annmts. <i>t</i> statistics	$E_2(L_2)$	-0.0010	1.1134 (0.90)	-0.0296 (-1.56)*	-0.0057 (-0.86)	0.0332	137
3 + ΔLL_{it} annmts. <i>t</i> statistics	$E_1(L_1)$	-0.0010	1.1195 (0.95)	-0.0252 (-3.29)***	-0.0059 (-1.31)	0.0342	81
4 + ΔLL_{it} annmts. <i>t</i> statistics	$E_2(L_2)$	-0.0010	1.1266 (1.06)	-0.0491 (-2.44)**	-0.0083 (-1.30)	0.0362	81
5 All ΔLL_{it} annmts. (3 day holding period) <i>t</i> statistics	$E_1(L_1)$	-0.0010	1.1172 (0.91)	-0.0023 (-0.78)	-0.0027 (-1.54)*	0.0255	137
6 All ΔLL_{it} annmts. (3 day holding period) <i>t</i> statistics	$E_2(L_2)$	-0.0011	1.1065 (1.10)	-0.0029 (-1.77)**	-0.0032 (0.90)	0.0262	137

^a Model (1) is estimated as a pooled, ordinary least squares regression with returns data from 2 January 1989 to 30 June 1990; *t* statistics (based on the cross-sectional distribution of SUR coefficients) with respect to a null value of 1 (β) and 0 (γ^E and γ^L) are in parentheses. Number of return observations in a regression = 6,630 (390 days times seventeen banks).

R_{it} = return on bank *i* for day *t*.

RB_t = percentage change for day *t* in NASDAQ bank stock index.

ΔLL_{it}^E = unexpected change in quarterly loan loss provision announced on day *t* for early disclosers (E), equals 1 for + ΔLL_{it}^E , -1 for - ΔLL_{it}^E , and 0 otherwise.

ΔLL_{it}^L = unexpected change in quarterly loan loss provision announced on day *t* for late disclosers (L), equals 1 for + ΔLL_{it}^L , -1 for - ΔLL_{it}^L , and 0 otherwise.

^b $E_1(L_1)$ = early (late) ΔLL_{it} defined as preceding (following) the median date of the sample of loan loss announcements for a given quarter.

$E_2(L_2)$ = early (late) ΔLL_{it} defined as the first three (all other) news dates of the sample of loan loss announcements for a given quarter.

^c # obs. of ΔLL_{it} = number of loan loss announcements for a given partition.

^d Significance of *t* statistics, one-tail tests for γ^E and γ^L , two-tail test for β .

* Significant at $p < .10$

** Significant at $p < .05$

*** Significant at $p < .01$

[row 4]. Overall, the γ^E coefficients are significantly less than zero based on the *t* values from the SUR regressions. As such, the results support H1a, namely that the market reaction to an early loan loss announcement is significantly negative.

The data in Table 3 also support H1b in that the negative γ^L coefficients are generally insignificant and thus not less than the negative γ^E coefficients. To test directly whether γ^E is statistically less than γ^L for model (1), a regression approach for 'threshold effects' is used (Greene, 1993). This approach is implemented by substituting ΔLL_{it}^E with the sum ($\Delta LL_{it}^E + \Delta LL_{it}^L$) and re-running the regressions. The test of $\gamma^E - \gamma^L < 0$ involves examining the significance of γ^L in each regression. The analysis shows (not reported) that, except for the partition of all 137 announcements for timing definition 1 [row 1], the differences in the timing coefficients, $\gamma^E - \gamma^L$, are significantly less than zero (one tail *t*-test, $p < .05$). H1b is

thus generally supported by the data, that is, the stock price reaction to an early announcement is significantly more negative than the reaction to a late announcement. Table 3 also reports the coefficients for γ^E and γ^L under the assumption that stock prices impound the information effects of a loan loss announcement made on day 0 over a three-day holding period (days -1, 0, and +1). The coefficients, while of the correct sign, are generally insignificant under this alternative [rows 5, 6].¹⁹

These results are conditional on a model of unexpected loan loss information, and any mis-specification of that variable may bias the results. For instance, the later a loan loss announcement is made in a quarter, the more likely the unexpected change variable is mis-specified as the loan loss expectation is not updated for the earlier announcements and other market or industry information. Thus, the observed δ^L coefficients may be biased toward zero and the differences in the coefficients, $\delta^E - \delta^L$, therefore overstated. This issue, however, is common to all event study research that applies a common expectations model to announcements that are sequenced in time, and it is unclear whether estimation of a more time-dependent model that involved additional parameters and assumptions would result in any net reduction in measurement error.²⁰ Notwithstanding such potential for error, the results for the different partitions generally support H1a and H1b, namely, that $\gamma^E < \gamma^L < 0$. For early disclosers of increased loan loss provisions, the stock price falls on average by almost 5 per cent on the day of announcement relative to a fall of less than 1 per cent for late disclosers [row 4].²¹

In addition to Table 3, analysis is undertaken of the price reaction of a late discloser at the time an early discloser makes a loan loss announcement. If early loan loss information is relevant to a late discloser, this should show up quickly as a stock price reaction of the late discloser. This idea is tested by restating model (1) as $R_{it} = \alpha + \beta RB_t + \gamma^E \Delta LL_{it}^E + \gamma^L \Delta LL_{it}^L + \gamma^{L'} \Delta LL_{it}^{L'} + v_{it}$, where the additional variable, $\Delta LL_{it}^{L'}$, is assigned a 1 (loan loss increase) or -1 (loan loss decrease) for a late discloser in a given quarter on the day of loan loss announcement by an early discloser and zero otherwise, with the prediction that the coefficient $\gamma^{L'} \leq 0$. This assumes that investors revise their expectations regarding the loan loss provision of a late discloser in the same direction as that implied by an early discloser's announcement. As expected, the average incremental price response of a late

¹⁹ This suggests that a three-day interval does not capture the loan loss price response as well as the one-day interval centred on the actual announcement day (day 0)—an expected result given that the research design pinpoints each disclosure to a given day.

²⁰ However, even with a 'perfect' loan loss expectations model, the expected difference $\gamma^E < \gamma^L$ should still be negative. This is because some information about a late bank's loan loss provision is revealed to the market at the time of an early bank's announcement (results in the succeeding paragraph), and thus, even if perfectly measured, less is revealed when the late bank makes its announcement.

²¹ Docking *et al.* (1997) provide some comparative data based on 390 regional bank loan loss announcements made during 1985–90. Measured as a two-day price change (days -1 and 0), they report that an increase in the loan loss provision is associated with a fall in the average regional bank stock price of 2.26 per cent overall, 4.49 per cent if accompanied by an operating loss, and 6.23 per cent if accompanied by a dividend reduction or omission. Thus, their results also suggest that the context of the loan loss disclosure makes a difference. They do not, however, analyse differences between early and late disclosers.

discloser on an early discloser's announcement date (after controlling for the change in bank stock returns generally), γ^L , is negative, though it is statistically insignificant based on the t distribution of the SUR coefficients ($\gamma^L = -0.24\%$, $t = -1.27$, timing definition 1; $\gamma^L = -0.26\%$, $t = -1.15$, timing definition 2).²²

Also, the signs and significance of the γ^E and γ^L coefficients in Table 3 are unchanged when model (1) is re-estimated including unit variables for the signs of ΔNII_{it} and ΔOIE_{it} . This suggests that potential correlations among the independent variables have only minimal effects on the γ^E and γ^L coefficients.

Information Responsiveness Tests

Model (2) examines the second hypothesis, namely, whether bank stock prices react as a function of the sign, magnitude and timing of the unexpected loan loss provision. The variables in this model are specified on a yield basis (per share amount of unexpected loan loss divided by price per share) so that the coefficients estimate the average amount of daily stock price change from a dollar per share of unexpected loan loss provision. The model includes additional variables to proxy for contemporaneous information, some of which may be correlated with loan impairment.²³

Table 4 shows the results of the regressions. Recall that model (2) is estimated as a pooled regression and the t values are based on the cross-sectional distribution of the SUR coefficients. The loan loss response coefficients for early disclosers, δ^E , are negative and generally statistically significant; and the loan loss coefficients for late disclosers, δ^L , are generally insignificant, though also negative. For example, for timeliness definition 1, coefficient $\delta^E = -0.0107$ ($t = -2.26$) and $\delta^L = -0.0111$ ($t = -1.60$) [row 1]; and, for timeliness definition 2, coefficient $\delta^E = -0.0205$ ($t = -1.34$) and $\delta^L = -0.0115$ ($t = -1.31$) [row 2].

Table 4 also shows the results of model (2) for early loan and late loan loss increases only. For the forty-four early versus the thirty-seven late (definition 1) loan loss increases, $\delta^E = -0.0752$ ($t = -2.27$) and $\delta^L = -0.0264$ ($t = -1.26$) [row 3]; and for the sixteen early versus the sixty-five late (definition 2) loan loss increases, $\delta^E = -0.2390$ ($t = -1.39$) and $\delta^L = -0.0251$ ($t = -1.12$) [row 4]. Last, there is a test of whether the difference $\delta^E - \delta^L$ is less than zero using the threshold approach (described previously) by substituting $\Delta LL_{it}^E/P_{it-1}$ in model (2) with the sum

²² Docking *et al.* (1997) present similar results regarding information transfer. For their New England sub-sample (one of six regions comprising 102 regional banks in total), they document a significant two-day (day -1 and 0) price response of -0.37 per cent. However, their significance tests may be overstated since all non-disclosers' reactions, which occur concurrently, are assumed independent observations.

²³ Unlike some earlier studies (e.g., Wahlen, 1994), the research design does not incorporate changes in non-performing loans and loan write-offs as potential explanatory variables. In collecting the data, separate (or earlier) announcements about non-performing loans and write-offs were not observed. However, for twenty announcements that disclosed data on changes in non-performing loans (ΔNPL_{it}) and loan loss provisions in the same news release, there was a positive correlation between the variables. For example, on a product-moment basis, $\text{corr}(LL_{it}, \Delta NPL_{it}) = 0.33$ ($F = 3.667$, probability = .0651) for ΔNPL_{it} = change relative to the previous quarter; and $\text{corr}(LL_{it}, \Delta NPL_{it}) = 0.46$ ($F = 4.9058$, probability = .0399) for ΔNPL_{it} = change relative to the same quarter one year ago. Loan loss provision and non-performing loan data thus reflect some common elements.

BANK LOAN LOSS PROVISIONS AND STOCK RETURNS

TABLE 4

MARKET PRICE RESPONSE TO EARLY VS. LATE UNEXPECTED CHANGE IN LOAN LOSS PROVISION

Model (2) ^a : $R_{it} = \alpha + \beta RB_t + \delta^E \Delta LL_{it}^E / P_{it-1} + \delta^L \Delta LL_{it}^L / P_{it-1} + \phi \Delta NII_{it} / P_{it-1} + \eta \Delta OIE_{it} / P_{it-1} + v_{it}$									
# ΔLL_{it} partition	Timing defn. ^b	α	β	δ^E	δ^L	ϕ	η	Adj. R sq.	# obs. ΔLL_{it} ^c
Predicted sign of coefficient			+	-	-	$\neq 0$	$\neq 0$		
1 All ΔLL_{it} t statistic ^d	$E_1(L_1)$	-0.0011	1.1240 (1.15)	-0.0107 (-2.26)**	-0.0111 (-1.60)*	0.1665 (1.92)*	-0.0324 (-1.15)	0.0348	137 (67 E_1)
2 All ΔLL_{it} t statistic	$E_2(L_2)$	-0.0011	1.1386 (1.25)	-0.2025 (-1.34)*	-0.0115 (-1.31)	0.1626 (1.06)	-0.0125 (-1.62)	0.0424	137 (24 E_2)
3 + ΔLL_{it} t statistic	$E_1(L_1)$	-0.0011	1.1271 (1.16)	-0.0752 (-2.27)**	-0.0264 (-1.26)	0.0020 (-1.27)	-0.0074 (-1.20)	0.0379	81 (44 E_1)
4 + ΔLL_{it} t statistic	$E_2(L_2)$	-0.0011	1.1349 (1.26)	-0.2390 (-1.39)*	-0.0251 (-1.12)	0.0111 (1.06)	-0.0049 (0.75)	0.0409	81 (16 E_2)

^a Model (2) is estimated as a pooled, ordinary least squares regression with returns data from 2 January 1989 to 30 June 1990; t statistics (based on the cross-sectional distribution of SUR coefficients) with respect to a null value of 1 (b) and 0 (δ^E , δ^L , ϕ , and η) are in parentheses. Number of return observations in a regression = 6,630 (390 days times seventeen banks).

R_{it} = return on bank i for day t .

RB_t = percentage change in NASDAQ bank stock index for day t .

$\Delta LL_{it}^{(E)}/P_{it-1}$ = unexpected change in quarterly loan loss provision per share deflated by price at $t-1$ announced on day t for early disclosers = E or late = L disclosers, 0 otherwise.

$\Delta NII_{it}/P_{it-1}$ = unexpected change in quarterly 'net interest income' per share deflated by price at $t-1$ announced on day t , 0 otherwise.

$\Delta OIE_{it}/P_{it-1}$ = unexpected change in quarterly 'other income and expenses' per share deflated by price at $t-1$ announced on day t , 0 otherwise.

^b $E_1(L_1)$ = early (late) ΔLL_{it} defined as preceding (following) the median date of the sample of loan loss announcements for a given quarter.

$E_2(L_2)$ = early (late) ΔLL_{it} defined as the first three (all other) news dates of the sample of loan loss announcements for a given quarter.

^c # obs. of ΔLL_{it} = number of loan loss announcements for a given partition.

^d Significance of t statistics, one-tail tests for δ^E and δ^L , two-tail tests for β , ϕ , and η .

* Significant at $p < .10$

** Significant at $p < .05$

*** Significant at $p < .01$

($\Delta LL_{it}^E / P_{it-1} + \Delta LL_{it}^L / P_{it-1}$). The $\delta^E - \delta^L$ differences are all significantly negative (one-tail test, $p < 0.5$).

This evidence is consistent with H2, namely, that bank stock prices react to both the sign and magnitude of the unexpected loan loss provision and the timing of the announcement relative to other banks. These results vary, however, in terms of the definition of announcement timing. For example, for a loan loss increase, the average response coefficient is greater for E_2 than E_1 announcements ($\delta^{E2} = -0.2390$ vs. $\delta^{E1} = -0.0752$), whereas the converse holds regarding the level of statistical significance ($t\delta^{E1} = -2.27$ vs. $t\delta^{E2} = -1.39$). With respect to the non-loan loss variables in model (2), the results are inconclusive. The coefficient for unexpected changes in net interest income (ΔNII_{it}) is significant for timing definition 1 ($\phi = 0.1665$; $t = 1.92$) but not for definition 2 ($\phi = 0.1626$; $t = 1.06$). The coefficients for changes in other income and expenses (ΔOIE_{it}) are insignificant.

Finally, I assess the relative impact of the loan loss announcements in the fourth quarter of 1989 by estimating the model $R_{it} = \alpha + \beta RB_t + \delta^{Q4} \Delta LL_{it}^{Q4} / P_{it-1} + \delta^{Q4*} \Delta LL_{it}^{Q4*} / P_{it-1} + v_{it}$, where ΔLL_{it}^{Q4} and ΔLL_{it}^{Q4*} represent unexpected loan loss provisions announced relative to the fourth quarter ($n = 26$) and the other quarters ($n = 111$), respectively. No distinction is made in timing due to an insufficient number of fourth-quarter observations. The estimated loan loss coefficients are $\delta^{Q4} = -0.0295$ ($t = -2.01$) and $\delta^{Q4*} = -0.0024$ ($t = -0.63$), suggesting that the strongest average response to the loan loss provisions occurs around the fourth quarter of 1989.²⁴ Additionally, when ΔNII_{it} and ΔOIE_{it} are partitioned into early and late announcements or when these variables are excluded from model (2), the loan loss response coefficients for the early and late partitions are similar to those reported in Table 4 [rows 1, 2].

SUMMARY AND CONCLUSIONS

This study hypothesizes and provides evidence of a differential negative market reaction to bank loan loss announcements based on the timeliness of the announcement relative to the end of a fiscal quarter. This evidence is based on a sample of announcements by seventeen New England banks that experienced generally deteriorating financial conditions during 1989–90. For example, banks that announced their loan loss information early (first three announcements in the sequence) experienced an average decrease in stock price on the day of announcement of almost 5 per cent, whereas the drop in stock price was less than 1 per cent for banks that announced late. A late announcer's stock price also dropped at the time of an early announcement but the decrease (of less than 1 per cent) was statistically insignificant.

In addition, the analysis reveals that bank stock prices responded as a function of the timing and the amount of unexpected change in the loan loss provision. Early disclosure of a one dollar per share unexpected increase in the loss provision, for instance, decreased the average bank's stock price by an estimated 23.9 cents. The loan loss response coefficient for banks that disclosed late in a quarter was substantially less negative than those that disclosed early in a quarter.

These results are mostly consistent with a stock market that obtains loan impairment information from timely sources of that information, for example, loss provisions reported in bank financial statements. As such, despite its discretionary nature

²⁴ This result could be due to a greater preponderance in the fourth quarter of other news stories on the same days that might have been affecting the sample bank stocks (e.g., bad news affecting all New England banks). The *Dow Jones News Wire* service and the *Wall Street Journal* of those twenty-six announcement days were reviewed for possible confounding effects. News stories relating to non-sample banks and banking generally in the region were identified for eighteen of the twenty-six days. These stories mostly covered news by other New England banks of earnings and dividends, changes in shareholder purchase and merger agreements, changes in management, and comments on the likelihood of interstate banking. The fourth quarter results, therefore, potentially reflect the effects of the sample banks' own announcements and the transfer of information to the sample banks from the non-sample banks experiencing similar unexpected increases in loan provisions.

and its use by managers as a signalling device, these results imply that investors act as if a change in a bank's loan loss provision, especially if it is made early in a quarter, reveals useful information about loan impairment.

Although reported in some earlier research (e.g., on loan loss announcements by U.S. money centre banks), this study does not find any evidence that investors, on the whole, react positively to an unexpected increase in the loan loss provision. Still, the results are not inconsistent with the view that loan loss provisions can provide favourable information about additional aspects of the firm. In the context of the New England banks studied during 1989–90, however, the negative effects dominated.

REFERENCES

- Beatty, A., S. L. Chamberlain and J. Magliolo, 'Managing Financial Reports of Commercial Banks: The Influence of Taxes, Regulatory Capital, and Earnings', *Journal of Accounting Research*, Autumn 1995.
- Beaver, W. H., C. Eger, S. G. Ryan and M. A. Wolfson, 'Financial Reporting, Supplemental Disclosures, and Bank Share Prices', *Journal of Accounting Research*, Autumn 1989.
- Beaver, W. H., and E. E. Engel, 'Discretionary Behavior With Respect to Allowances for Loan Losses and the Behavior of Security Prices', *Journal of Accounting and Economics*, August–December 1996.
- Bernard, V., and J. Thomas, 'Evidence that Stock Prices Do Not Fully Reflect the Implications of Current Earnings for Future Earnings', *Journal of Accounting and Economics*, December 1990.
- Docking, D. S., M. Hirshey and E. Jones, 'Information and Contagion Effects of Bank Loan-Loss Reserve Announcements', *Journal of Financial Economics*, February 1997.
- Elliott, J. A., J. D. Hanna and W. H. Shaw, 'The Evaluation by the Financial Markets of Changes in Loan Loss Reserve Levels', *The Accounting Review*, October 1991.
- Freeman, R. N., and S. Y. Tse, 'An Earnings Prediction Approach to Examining Intercompany Information Transfers', *Journal of Accounting and Economics*, December 1992.
- Greene, W. H., *Econometric Analysis*, 2nd edn., Macmillan, 1993.
- Griffin, P. A., and S. J. R. Wallach, 'Latin American Lending by Major U.S. Banks: The Effects of Disclosures about Nonaccrual Loans and Loan Loss Disclosures', *The Accounting Review*, October 1991.
- Hoskins, R. E., J. S. Hughes and W. R. Ricks, 'Evidence on the Information Content of Additional Firm Disclosures Made Concurrently with Earnings', *Journal of Accounting Research*, Supplement, 1986.
- Judge, G. G., R. C. Hill, W. E. Griffiths, H. Lütkepohl and T. Lee, *Introduction to the Theory and Practice of Econometrics*, 2nd edn., John Wiley & Sons, 1988.
- Lipe, R. C., 'The Information Contained in the Components of Earnings', *Journal of Accounting Research*, Supplement 1986.
- Liu, C., and S. G. Ryan, 'The Effect of Bank Loan Portfolio Composition on the Market Reaction to and Anticipation of Loan Loss Provisions', *Journal of Accounting Research*, Spring 1995.
- Liu, C., S. G. Ryan and J. M. Whalen, 'Differential Valuation Implications of Loan Loss Provisions Across Banks and Fiscal Quarters', *The Accounting Review*, January 1997.
- Musumeci, J. J., and J. F. Sinkey, Jr., 'The International Debt Crisis and Bank Loan-Loss-Reserve Decisions: The Signaling Content of Partially Anticipated Events', *Journal of Money, Credit, and Banking*, August 1990.
- Slovin, M. B., M. E. Sushka and J. A. Polonchek, 'Informational Externalities of Seasoned Equity Issues', *Journal of Financial Economics*, August 1992.
- Whalen, J. M., 'The Nature of Information in Commercial Bank Loan Disclosures', *The Accounting Review*, July 1994.

STEWART JONES AND LOURA WIDJAJA

The Decision Relevance of Cash-Flow Information: A Note

The release of Approved Australian Accounting Standard AASB 1026, *Statement of Cash Flows*, in 1992 has made it mandatory for Australian public companies to prepare detailed cash-flow statements under the direct method. While the Standard claims many benefits will flow to financial statements users on the introduction of cash-flow statements (CFSs), the new regulation has been subjected to little empirical investigation in Australia. One noteworthy deficiency in the literature is addressed in this study. Few, if any, comprehensive empirical studies have explored the decision-making functions of the CFS by the actual users of financial reports. The results of this study are based on a survey of 159 financial statement users, of which eighty-three were loan officers and seventy-six were financial analysts in Australia. The overall results indicate strong support for the CFS by these user groups. Furthermore, financial analysts appear to be an equally significant, if not greater, user of the CFS than loan officers. The results have particular relevance to international accounting jurisdictions, notably the U.K. and U.S.A., where a choice between direct and indirect methods for preparing CFSs are currently permitted (cf. McEnroe, 1996).

Key Words: Accounting standards; Cash flow; Decision making.

INTRODUCTION AND OBJECTIVES

In a recent Australian work on cash flow reporting, Jones *et al.* (1995, p. 115) observed that, on the introduction of Approved Australian Accounting Standard AASB 1026, *Statement of Cash Flows* (1992), Australia joined an increasing number of Western countries to adopt comprehensive cash-flow statement (CFS) regulations. Jones *et al.* summarize the development of both Australian and international cash-flow regulations (pp. 115–17), rendering it unnecessary to reiterate these issues here. The accelerating international trend towards cash-flow reporting has undoubtedly been fuelled in part by the unprecedented spate of corporate collapses, coupled with worldwide economic recessions, most felt during the late 1980s and early 1990s (Lawson, 1991; Walker and Robinson, 1994).

As a result of these developments, there have been numerous suggestions in the literature that the CFS has achieved, albeit by a somewhat circuitous route, the status of a primary financial statement, adding comparable importance to the profit

and loss statement and balance sheet (e.g., Lee, 1993). Australian academics appear to have received these fundamental changes to our traditional financial reporting landscape in studied silence. For instance, Jones *et al.* (1995) note that, in contrast to the U.S.A. and U.K., there has been little Australian empirical research on the relevance and utility of the CFS, both prior to and subsequent to the issuance of AASB 1026.

Indeed, a primary purpose of this article is to meet the call for greater research efforts on the CFS and to evaluate its growing significance on the Australian financial reporting environment. Besides the benefits accruing to the Australian accounting profession, relevant research on this topic will also prove useful on an international level. For instance, the Australian reporting jurisdiction provides another important context by which the growing international trend towards cash-flow reporting can be continually assessed and contrasted. Furthermore, much of the cash-flow literature, particularly in the U.S.A. and U.K., was developed prior to the introduction of formal cash-flow regulations (see, e.g., Lee, 1981). Examining the decision relevance of CFSs after the introduction of formal regulations provides a more informative and tangible context for evaluating commercial attitudes to the CFS.

The Jones *et al.* (1995) article, which is the only contemporary Australian survey on cash-flow reporting, indicated strong support for CFS regulations by representatives of Australian public companies, including some of the more stringent provisions of AASB 1026. However, that analysis was limited to internal managerial views, not external users. A useful extension is to examine the decision relevance of AASB 1026 by major user groups. This approach is considered particularly appropriate, given that the theoretical justification of cash-flow reporting has long been linked to the existence of external users and their perceived needs for relevant economic information (see Lee, 1972a, 1993). Evaluating the CFS by reference to major user groups therefore constitutes a more pertinent test of the financial statement's decision-making relevance. Further, considering that the sole purported rationale of AASB 1026 is to benefit external users (par. 7), examining their views provides a more relevant basis for assessing the AASB's policy decision to replace the funds statement with the CFS.

The present study is based on a survey of 159 financial statements users, of which eighty-three were loan officers (LOs) and seventy-six were financial analysts (FAs). The survey analysed their ratings of several decision contexts of the CFS, many of which were replicated from the Jones *et al.* (1995) survey instrument. In addition, the current survey sought to overcome limitations in the previous literature which have tended to examine the decision-relevance of the CFS in isolation from other financial statements.

It is expected that the empirical data related to these and other issues will be relevant for evaluating the specific impact of AASB 1026 on the decision-making tasks of actual users; identifying the decision-making functions of the CFS; and, more generally, evaluating some aspects of the present and future direction of the cash-flow reporting phenomenon in Australia and overseas. In particular, the results are relevant to several international accounting jurisdictions, including

the U.S.A. and U.K., where a choice between the direct and indirect methods is currently permitted. It is noteworthy that the conclusions of our study complement the recent survey findings of McEnroe (1996), who indicated relatively greater support for the direct method, as opposed to the indirect method, of reporting cash flows by investment advisers, financial analysts, college professors and accountants in the United States.

RESEARCH QUESTIONS AND LITERATURE REVIEW

The study poses the following questions:

Question 1: In general terms, what are the attitudes of loan officers and financial analysts regarding:

- (i) the overall relevance of company financial reports, and the cash-flow statement in particular, for economic decision making;
- (ii) the decision relevance of the cash-flow statement, used both in isolation and in conjunction with other accrual-based financial statements;
- (iii) the decision relevance of the direct versus indirect method of reporting cash flows?

Question 2: Which decision contexts of the CFS do loan officers and financial analysts rate relatively more highly?

The theoretical development of cash-flow reporting largely originated with Lee and Lawson (notably, Lee, 1972a, 1978, 1993). Much of the relevant literature contains theoretical discourses about the potential decision-making advantages of the CFS, particularly in the context of the limitations of the accrual measurement framework (see Rappaport, 1988; Neill *et al.* 1991; Lee, 1993). Some recent studies have evaluated the information content provided by accrual and cash flow based measures of a firm's operating performance and financial condition. For example, the empirical results of Ingram and Lee (1997) indicate that a firm's financial condition can be described by the longer term *joint* accounting relation between income and operating cash flow.

However, literature evidence relating to the utility of the CFS to different user groups relies largely on conjectures rather than on empirical evidence (e.g., Lee, 1981; Henderson & Maness, 1989; Hackel & Livnat, 1991).

To reiterate, the importance of this issue can be appreciated given that the theoretical underpinnings of the cash-flow reporting movement (and arguably all company financial reporting) is intrinsically linked to the perceived information needs of users. This connection has been long established in the literature. For instance, the foundation of Lee's (1971, 1972a, 1972b) advocacy of CFSs is based entirely on the principles of utility and relevance to users (see also Lawson 1972, 1975). Not only does this contention require the identification of specific user groups, but also the influence and bearing that cash-flow information has on the decisions and actions that users are likely to make (Lee, 1972a; Climo, 1976, Neill *et al.*, 1991).

While a largely neglected issue, the relevance of the CFS to external users has been explored in a few empirical studies. For example, Lee (1981) found that Scottish accountants and audit partners perceived the CFS to be relevant to a range of users, particularly bankers and shareholders. McEnroe's (1989) partial replication of the Lee study on U.S. audit partners yielded findings largely consistent with Lee. Using a similar methodology, Jones *et al.* (1995) note that representatives of Australian firms perceived the CFS to be relevant to all user groups except employees, consumers and suppliers. Furthermore, all of the above studies have established bankers to be the most prominent users of the CFS (see also Fulmer *et al.*, 1991). In contrast to previous literature, the present study draws attention to the use of CFSs by two major user groups, LOs and FAs (see Griffin, 1987). Their respective ratings of the CFS were contrasted across a number of decision contexts.¹

METHODOLOGY

Research Procedure

The sample was derived from the Directory of Australian Financial Institutions (1992), supplemented by the Interdata Financial Handbook (1994). Together, these directories contain a comprehensive list of almost all financial institutions in Australia (over 400), including all banks, finance houses and stockbroking firms.

Two survey instruments were designed, one for LOs and the other for FAs. To assist any comparisons, both the LOs and the FAs were asked the same questions, modified only to reflect the lender or investment focus of the particular user group.²

Because the survey was to be sent separately to the LO and FA groups, it was necessary to subdivide the sample into two main groups: entities that are likely to be primarily lenders, and having substantial operations which involve commercial loans to companies (mainly banks and finance houses); and firms that are likely to engage FAs in the process of making and evaluating commercial investment decisions (mainly stockbroking firms).

¹ Two user groups were examined for the following reasons. First, the CFS clearly has a wider sphere of decision-making relevance if it can be established that the document meets the information needs of more than one primary user group. Comparable ratings of the CFS between LOs and FAs (assuming they are favourable) could suggest that the CFS possesses the qualities of a general purpose document capable of meeting the decision-making needs of a range of users. Second, the literature indicates that users of company financial reports are not necessarily a homogeneous group that rely on the same or a similar information set for economic decision making. For instance, Griffin (1987, pp. 98ff.) concluded that LOs are more sophisticated, and place greater reliance on company-produced financial information than FAs and other users. Hence, a study based on a single-user group is probably too limiting to draw convincing conclusions about the decision relevance of the CFS.

² For example, Question 25 of the loan officer survey asked: 'When making commercial lending decisions, cash flow statements are most useful for . . .'. With respect to the financial analyst survey, the same question was asked from a different decision orientation: 'When making commercial investment decisions, cash flow statements are most useful for . . .'.

Naturally, this division is not precise and it results in overlaps. For instance, banks and finance houses are likely to be involved in actual lending and in the financial analysis of companies to assist other decision-makers. However, the cover letter which was sent to firms clearly indicated the purpose of the survey instrument, and the background of the individual(s) required to complete the survey. Accordingly, there was little chance that an FA would fill in the survey relating to LOs and vice versa.³

An analysis of the demographic data revealed that 76.3 per cent of all respondents to the financial analyst survey were representatives of stockbroking firms. The remainder were FAs employed by finance houses or money-market corporations. Furthermore, 83 per cent of all respondents in the loan officer survey were representatives of various banking corporations, and the remainder were largely associated with finance houses.⁴

The cover letter defined a CFS in the context of the definitions, format and classifications adopted in the Australian accounting standard AASB 1026.⁵ Furthermore, it was emphasized that AASB 1026 is based on historical cash flows and does not refer to future cash-flow information. The cover letter defined the profit and loss statement in the context of definitions, format and classifications adopted in Australian accounting standard AASB 1018. However, there are presently no Australian accounting standards guiding balance sheet disclosures. Hence, the balance sheet was simply defined to mean a document which discloses all assets, liabilities and equity which met the then disclosure requirements of Schedule 5 of the Corporations Law (1991) and the definition and recognition criteria of Statement of Accounting Concepts (SAC) 4, *The Definition and Recognition of Elements of Financial Reports*.⁶

Lastly, the cover letter indicated that the survey was only applicable to *commercial* loan and investment decisions. The word commercial means, in this context, loans and investments which relate wholly or substantially to business firms.

³ Nonetheless, the following precautions were taken: the cover letter defined an FA to be an individual principally involved in the analysis of financial (and other) information for the purposes of making and evaluating equity investment decisions. A loan officer was defined to be an individual principally involved in making and evaluating loan requests. Furthermore, all respondents were required in the survey instrument to state their occupation and work-related experience. The survey results did not reveal any inconsistencies between stated occupations of respondents and the intended audience of the survey instrument.

⁴ The specific breakdown is as follows: *trading banks* (LOs: $n = 18$; FAs: $n = 1$); *stockbroking companies* (LOs: $n = 0$; FAs: $n = 58$); *State and special banks* (LOs: $n = 4$; FAs: $n = 0$); *money market corporations* (LOs: $n = 16$; FAs: $n = 3$); *foreign banks* (LOs: $n = 24$; FAs: $n = 3$); *savings banks* (LOs: $n = 7$; FAs: $n = 0$); *finance companies* (LOs: $n = 5$; FAs: $n = 2$); and *others* (LOs: $n = 9$; FAs: $n = 9$).

⁵ Some of the salient requirements of this Standard are: use of the direct method of reporting cash flows; classification of cash flows into operating, financing and investing activities; and provision of a statement reconciling operating cash flows to net income.

⁶ It should be noted that a new Approved Australian Accounting Standard AASB 1034, *Information to be Disclosed in Financial Reports* (issued in December, 1996), now incorporates certain balance sheet disclosure requirements of Schedule 5 of the Corporations Regulations, including a number of additional disclosure requirements from other standards.

Commercial loan/investment decisions were emphasized because these decisions are more likely to entail the analysis and interpretation of company financial statements, including the CFS.

Response Rate

Both questionnaires were mailed to the subjects, and were returned via a stamped self-addressed envelope. An initial reminder was sent after one week of circulating the instrument, and a second reminder was sent two weeks after the first. For the LO group, a response rate of 45.1 per cent was achieved. This was based on eighty-three (sample 184) returned usable questionnaires.⁷ In contrast, the FA questionnaire achieved a response rate of 40.2 per cent. This rate was based on seventy-six usable questionnaires (sample of 189).⁸

Instrument

The survey instruments sent to LOs and FAs each comprised 115 questions on a five-point Likert scale, with responses ranging from 'strongly agree' to 'strongly disagree'; 'very important' to 'not important'; and 'very useful' to 'not useful'. The instrument elicited information on the following issues: respondent characteristics (including respondent occupation, commercial experience, accounting training, qualifications and level of understanding of accounting information); company characteristics (including asset size, sales revenue, number of employees, industry membership); decision contexts (i.e., respondents were asked to rate twenty-one decision contexts in which the CFS was used in the decision-making process). The decision contexts primarily embraced the following features of business planning and control: liquidity and solvency evaluation; performance evaluation; prediction functions; and monitoring evaluation functions.

A number of questions relating to respondent characteristics, company characteristics and the decision-making functions of the CFS were replicated from the studies of Lee (1981) and Jones *et al.* (1995).

Reliability of instrument. Cronbach's alpha was calculated to measure the reliability of the instrument. This measure is a test of the homogeneity of the questions and the degree to which all items measure one factor. When all items were subjected to Cronbach's alpha, the standardized alpha coefficient was over 0.8 for both survey instruments, indicating an acceptable level of reliability (see Nunnally, 1978, p. 245).

Tests for non-response error. In order to test for non-response error, some of the underlying characteristics of the respondent groups were tested against the non-respondent groups. Of the non-respondents, approximately 50 per cent were randomly selected from both the LO group ($n = 50$) and the FA ($n = 54$)

⁷ The sample size was reduced to 184 from the original 200 owing to the fact that six questionnaires were inadvertently sent to wrong addresses; ten questionnaires being returned because the firms indicated they were not principally involved in loan decisions; two questionnaires were unusable.

⁸ The sample size was reduced from the original 200 owing to the fact that eleven questionnaires were inadvertently sent to wrong addresses. Finally, six other questionnaires were unusable.

group. Overall, results indicated that the respondent LOs and FAs are likely to be representative of the respective non-respondent LO and FA groups.⁹

Profile of Subjects

Loan officers involved five distinct groups: directors/heads of company ($n = 10$); senior loan managers ($n = 3$); loan managers ($n = 25$); senior LOs ($n = 36$); and LOs ($n = 9$). The FA group, however, had the following breakdown: director/heads of company ($n = 37$); senior FAs ($n = 9$); and FAs ($n = 30$).

The majority of respondents in both groups held senior positions in their organizations and reported considerable commercial experience in their respective fields, averaging twelve years for both user groups. While there was little difference in the overall levels of qualification between the two groups (a university bachelor's degree in a commercial discipline being the norm), a much greater number of FAs (64.5 per cent) had an accounting-specific qualification when compared to LOs (35.5 per cent). Furthermore, both LOs and FAs rated their perceived understanding of accounting information (as presented in conventional financial statements) to be well above average. Consistently with the above, a significantly greater proportion of LOs (64 per cent) indicated that they were provided with formal ongoing training in accounting-related disciplines by their firms as compared to FAs (35 per cent). This is in spite of the finding that FAs (61.8 per cent) appeared to have a higher level of accounting-specific commercial experience when compared to LOs (44.6 per cent). In terms of company size, LOs tended to represent larger firms (sales revenue ranged between \$A101M and \$A300M) than the FA group (sales revenue of \$A30M or less).

Most of these variables (i.e., respondent occupation, stated qualifications, accounting-specific work experience, industry membership and company size) were tested in order to determine if any meaningful correlations existed with survey responses to questions on the CFS. These variables were found to be, in most instances, unrelated to respondent ratings of various aspects of the decision relevance of the CFS.

⁹ The non-respondents were telephoned and asked a number of questions relating to their qualifications, commercial experience, understanding of accounting information, size of their representative companies, and the relevance of the CFS and other financial statements in the commercial loan/investment decision-making process. The survey was serially numbered so that non-respondents could be contacted. With respect to the LO and FA groups, non-significant differences were observed on nearly all of the above questions, suggesting that the respondent groups were likely to be representative of the non-respondent groups.

Potential limitations of this study also need to be considered. One limitation of this study relates to the research instrument. While the instrument was tested on a number of academics for its face validity and content, it was neither examined for test-retest reliability nor construct validity. While construct validity was not specifically tested for, the present study replicated a number of survey questions from Lee (1981) and Jones *et al.* (1995). This procedure improved the validity of the instrument. While this procedure will not minimize construct validity problems, they will nevertheless be reduced. Another potential limitation relates to the response rate. While the response rate was fairly low for both the LO and FA instruments, it was considered adequate given that few surveys in the social sciences achieve a response rate of greater than 50 per cent. Furthermore, the problems associated with random sampling error were minimized by specific tests for non-response error.

DECISION RELEVANCE OF CASH FLOWS

TABLE 1

RATINGS OF THE OVERALL RELEVANCE OF FINANCIAL REPORTS

Item	Loan officers (n = 83)	Financial analysts (n = 76)	t statistic	Z statistic
Overall relevance of financial reports				
Overall usefulness of financial reports in making and evaluating commercial lending/investment decisions	4.31 (.75)	3.91 (.97)	-2.97**	-2.76**
Overall usefulness of CFS in making and evaluating commercial lending/investment decisions	4.15 (.75)	3.93 (1.01)	-1.50	-1.10

Note: Standard deviation in parenthesis. Lower mean scores indicate lower ratings of usefulness (i.e., 1 = Not very useful; 5 = Very useful), *p < 0.1, **p < 0.05.

RESULTS AND DISCUSSION

This section presents the results on the research questions outlined above. Both parametric and nonparametric statistics are provided for all results, with both tests yielding equivalent outcomes.¹⁰

Results on Question 1

(i) The overall relevance of company financial reports, and the cash flow statement in particular, for economic decision making.

Initially, it was not automatically presumed that respondents would consider conventional financial statements, including the CFS, to be relevant for economic decision making. For instance, Griffin (1987) could only establish a fairly modest relationship between traditional financial statements and their relevance to the economic decision making of lenders and investors.

The results indicate that LOs and FAs rate both the CFS and other financial statements (the profit and loss statement and balance sheet) to have a reasonably high degree of relevance for the purposes of making and evaluating commercial loan/investment decisions. Table 1 displays the mean scores, standard deviations, t statistics and Z statistics of these results (similar statistical information appears in subsequent tables).

Notwithstanding that this questionnaire item was intended to be generic, the results in Table 1 indicate that LOs rated the decision relevance of financial statements relatively more highly than the FA group. The decision relevance of the CFS was rated comparably by both the LO and FA groups. However, *within* the LO and FA groups, there were no statistically significant differences in ratings of the CFS and other financial statements. Hence, this result implies that the CFS

¹⁰ Parametric statistics provide valuable information which is obscured by the non-parametric descriptive tests (e.g., median scores). However, relying on parametric results alone would be unsatisfactory in this study as specific tests for normality were not conducted on our data sample. It was therefore appropriate to report both test results.

TABLE 2

RATINGS OF THE CONJUNCTIVE RELEVANCE OF THE CFS

Item Conjunctive relevance of the CFS	Loan officers (n = 82)	Financial analysts (n = 75)	t statistic	Z statistic
Overall usefulness of CFS when used <i>in isolation</i> of other financial reports for making and evaluating commercial lending/investment decisions	2.99 (1.24)	3.05 (1.09)	.35	-0.19
Overall usefulness of CFS when used <i>in conjunction</i> with other financial reports for making and evaluating commercial lending/investment decisions	4.22 (.89)	3.97 (.92)	-1.71*	-2.00**

Note: Standard deviation in parenthesis. Lower mean scores indicate lower ratings of usefulness (i.e., 1 = Not very useful; 5 = Very useful). *p < 0.1, **p < 0.05.

could have comparable relevance and standing relative to the other primary financial statements in the economic decision making of both user groups.

The relevance of the CFS is corroborated in other ways. Both LOs and FAs use CFSs (including other primary financial statements) in almost 100 per cent of all loan and investment decisions. Additionally, the principal method of using CFSs for decision making by LOs and FAs is in financial comparisons (i.e., comparison with previous years' data and comparisons with other firms) and in financial ratio analysis.¹¹

(ii) *The decision relevance of the cash-flow statement, used both in isolation and in conjunction with other accrual-based financial statements.*

This issue was addressed because, as previously stated, many cash-flow studies have tended to evaluate the decision relevance of the CFS in isolation from other primary financial statements. This can provide an incomplete and, in some circumstances, misleading impression of the relevance of the CFS. For instance, high ratings of the CFS (when examined in isolation from other financial statements) can, and perhaps mistakenly, indicate that the CFS has superseded or even usurped the need for accrual-based financial reports in user decision making. It is equally possible that the real function and value of the CFS resides in its capacity to complement existing accrual-based information.¹² Table 2 displays the results.

¹¹ The results also indicate that both LOs and FAs use historical cash flows more frequently in loan/investment decisions than future cash flow data. However, while LOs rated historical and future cash flows as having comparable importance for decision making, most FAs rated the decision relevance of future cash flows significantly more highly than historical cash flows ($X^2 = 4.083$, $p < .05$).

¹² Support for this contention exists in the literature, particularly in capital market research (see Neill *et al.*, 1991). For instance, it indicates that investors impound the combined affects of both operating cash flows and earnings announcements in the process of setting security prices (see Wilson, 1987, pp. 319-20).

The results depicted in Table 2 indicate that both LOs and FAs rated the relevance of the CFS considerably more highly when the document is used in *conjunction* with other primary financial statements for decision making. However, this finding needs to be tempered with the caveat that ratings of the CFS in Table 2 were not especially high (i.e., most mean scores were around '4' or 'agree' on the five-point Likert scale used). Also of interest is whether the CFS is used more often in a decision interface with the profit and loss statement, the balance sheet or some other financial statement. For instance, if the CFS is used more frequently by LOs and FAs in conjunction with the profit and loss statement (as opposed to the balance sheet) this could suggest that the CFS is potentially more relevant in a flow of resources/performance context, as opposed to, say, a liquidity context. The results indicate that the great majority of LOs and FAs used both the profit and loss statement and the balance sheet in conjunction with the CFS for nearly all loan/investment decisions. Furthermore, both user groups rated the profit and loss statement and the balance sheet as equally important in their conjunctive capacity or role with the CFS. However, consistent with the findings of Jones *et al.* (1995), very few respondents confirmed using the funds statement for decision making.

Overall, these results indicate that the CFS supplements or complements financial information provided in profit and loss statements and balance sheets, rather than circumventing the relevance of this information altogether. Also, the results indicate that, by complementing both the profit and loss statement and the balance sheet, the CFS is likely to facilitate user evaluations of a variety of decision contexts for which these documents are traditionally associated, namely performance assessments and liquidity evaluation. Results on Question 2 provide some corroboration for this conjecture.

(iii) *The decision relevance of the direct versus indirect method of reporting cash flows.*

Preferred formats of the CFS also have an important bearing on ratings of the decision relevance of CFSs. The cash-flow literature (e.g., Heath, 1978; Lee, 1983; 1993) indicates that the direct method of reporting cash flows is superior to the indirect method. The indirect method, which is a feature of cash-flow standards in the U.S.A. and U.K., is little more than a reconciliation account readily derivable from the profit and loss statement and balance sheet. This method provides no additional information to that in the funds statement prepared on a cash-flow basis of accounting (e.g., Heath, 1978; Eastman, 1993; Ingram and Lee, 1997). The Australian cash-flow standard AASB 1026 took a decisive and controversial stand by mandating the direct method. It is the most critical aspect of AASB 1026 in terms of the provision of relevant information to users. By examining the direct versus indirect method in Question 2, valuable insights are obtained about whether AASB 1026 is meeting user information needs as predicted by standard-setters. Furthermore, some inferences can be made about the depth or extent to which CFS information is used by LOs and FAs for decision making.

Data indicate that a majority of Australian LOs and FAs supported the direct method for decision making. Over 70 per cent ($n = 157$) of LOs' and FAs' responses

TABLE 3

COMPARATIVE RATINGS OF THE DIRECT METHOD VS INDIRECT METHOD

Item Direct method	Loan officers (n = 82)	Financial analysts (n = 75)	t statistic	Z statistic
Provides better understanding of cash-flow data	4.01 (.62)	3.77 (.73)	-2.22**	-2.30**
Facilitates better cash-flow analysis	3.98 (.74)	3.71 (.69)	-2.35**	-2.46**
Is a better indicator of solvency	3.72 (.81)	3.60 (.70)	-.99	-1.20
Reflects accepted commercial practice	3.76 (.68)	3.75 (.70)	-.09	-.44
Has a sounder conceptual basis	3.80 (.69)	3.71 (.73)	-.86	-.66
Provides more useful information	3.99 (.87)	3.73 (.66)	-2.05**	-2.54**
Is more useful to estimate future cash flows	3.83 (.87)	3.61 (.68)	-1.72*	-1.90*
Is more useful for assessing the quality of earnings	3.55 (.77)	3.45 (.70)	-.81	-.97

Note: Standard deviation in parenthesis. Lower mean scores indicate lower ratings of importance (i.e., 1 = Strongly disagree; 5 = Strongly agree). *p < 0.1, **p < 0.05.

indicated they preferred the direct method. Less than 5 per cent ($n = 157$) of respondents actually preferred the indirect method, with the remainder having no particular preference for either method.¹³ Table 3 displays ratings of various reasons LOs and FAs support the direct method.¹⁴

While LOs rated certain reasons for supporting the direct method more highly than FAs, the results appear to indicate that both user groups prefer the more detailed, varied and complex cash flow information displayed under the direct method. However, once again, caution needs to be exercised in interpreting the results as some of the mean values reported in Table 3 are only in the mid-range range of '3' or 'neutral' on our five-point Likert scale.

Jones *et al.* (1995) examined ratings of the direct vs indirect method by managers and internal representatives of companies. Comparison of the present results with Jones *et al.* indicate that while the indirect method was preferred by the majority of managers (and other internal interests), both LOs and FAs rated the direct method more highly on most items. This discrepancy, while not substantial, could be due to differences in the respondents surveyed.¹⁵

The preference for the direct method by the majority of LOs and FAs was highlighted in the ratings of the three key cash-flow measures reported under this

¹³ The results also indicate that over 80 per cent of firms analysed by the LO and FA groups prepared CFSs on the direct basis of financial reporting. While these results indicate that regulatory compliance with AASB 1026 is high, they are also consistent with the findings of Jones *et al.* (1995), which suggest that the majority of Australian firms prefer to prepare CFSs on the direct basis of reporting. The findings contrast sharply with U.S. findings (e.g., see Sondhi *et al.*, 1988) which demonstrate that the indirect method is the overwhelming choice of U.S. firms.

¹⁴ This facet of the survey instrument was replicated directly from Jones *et al.* (1995).

¹⁵ Jones *et al.* (1995) surveyed preparers, not external users. Owing to cost considerations, it stands to reason that preparers are likely to be less inclined to favour greater financial disclosures than external users (see Jones *et al.*, 1995, pp. 127-8).

DECISION RELEVANCE OF CASH FLOWS

TABLE 4

COMPARATIVE RATINGS OF DIFFERENT CASH-FLOW MEASURES

Item Cash-flow measure	Loan officers (n = 82)	Financial analysts (n = 75)	t statistic	Z statistic
Cash flow from operations	4.85 (.36)	4.69 (.52)	-2.27**	-2.10**
Cash flow from financing activities	4.20 (.60)	3.99 (.92)	-1.69*	-1.12
Cash flow from investing activities	3.88 (.89)	4.08 (.73)	1.54	-1.17

Note: Standard deviation in parenthesis. Lower mean scores indicate lower ratings of importance (i.e., 1 = Not important; 5 = Very important). *p < 0.1, **p < 0.05.

method. Both LOs and FAs rated the decision-making relevance of operating cash flows fairly highly, as they did cash flows from financing activities, and cash flows from investment. These measures all require separate disclosure under AASB 1026. The results are reported in Table 4.

Consistent with the results of Jones *et al.* (1995, p. 120), respondents, particularly LOs, rated operating cash flows as the most significant cash-flow measure. The relatively higher ratings by FAs of investing cash flows, and the higher ratings in their assessments of financing cash flows by LOs, appear to reflect the traditional reporting foci of both user groups. Further, the preference for the direct method by the majority of LO and FA respondents could indicate a potentially high degree of analytical proficiency and sophistication in the use of the CFS by users, extending well beyond 'line items' and summary measures, such as net cash balance, featured under the indirect method.

Results on Question 2

Which decision contexts of the CFS do loan officers and financial analysts rate relatively more highly?

As was previously mentioned, both LOs and FAs were requested to rate a number of decision contexts in which CFSs are used in the loan/investment decision-making process. Those decision contexts are replicated and extended from Lee (1981) and Jones *et al.* (1995), which had emerged from the literature where CFSs have been argued to be most relevant for decision making. It is acknowledged that while those decision contexts are intended to be comprehensive and representative, they are not exhaustive of all possible decision contexts. Table 5 displays the results.

It is noteworthy that both LOs and FAs rated the relevance of the CFS reasonably highly across most of the specified decision contexts. Consistent with the conclusions of Jones *et al.* (1995, p. 122), the fact that the CFS is relevant across a range of decision contexts indicates that the real strength of the document for decision making could reside in its dynamic flexibility and general purpose character.

However, the results indicate certain variations in ratings of the CFS by LOs and FAs. More detailed analysis of Table 5 (using one-way ANOVA and Duncan's *post hoc* test) indicated that FAs rated liquidity and solvency factors and monitoring

TABLE 5

COMPARATIVE RATINGS OF VARIOUS DECISION CONTEXTS OF THE CFS

Item Decision contexts of the CFS	Loan officers (<i>n</i> = 82)	Financial analysts (<i>n</i> = 75)	<i>t</i> statistic	<i>Z</i> statistic
Evaluating liquidity ^a	4.00 (.98)	3.95 (.79)	-.37	-.92
Evaluating solvency ^a	3.35 (1.01)	3.91 (.96)	3.51***	-3.63**
Evaluating financial flexibility ^a	3.80 (.58)	3.71 (.97)	-.78	-.18
Evaluating creditworthiness ^a	3.48 (.86)	3.72 (.86)	1.77*	-1.44
Evaluating ability to service debt ^a	4.52 (.59)	4.41 (.60)	-1.17	-1.26
Evaluating ability to pay dividends ^a	3.45 (.93)	3.97 (.72)	3.91***	-3.83***
Evaluating ability to fund changes in the scope and nature of operations ^a	3.98 (.80)	3.96 (.83)	-.12	-.13
Assessing quality of net income ^a	3.35 (1.13)	3.49 (1.03)	.81	-.83
Highlighting differences between net income and final cash balances ^a	3.59 (1.01)	3.85 (.77)	1.87*	-1.55*
Evaluating quality of management ^b	2.88 (.99)	2.71 (1.01)	-1.07	-1.20
Evaluating overall company performance ^b	3.43 (.93)	3.49 (.91)	.45	-.18
Evaluating profitability of the company ^b	3.05 (1.08)	3.35 (1.02)	1.78*	-1.62*
Evaluating company stability ^b	3.48 (.79)	3.51 (.83)	.24	-.03
Evaluating operating performance ^b	3.59 (.97)	3.52 (.84)	-.53	-1.16
Comparing performance with other firms ^b	3.20 (1.07)	3.41 (1.02)	1.31	-1.11
Monitoring fixed asset investment ^c	3.11 (.99)	3.39 (.93)	1.80*	-1.75*
Monitoring changes in financial position ^c	3.57 (.92)	3.80 (.59)	1.82*	-1.26
Monitoring changes in working capital ^c	3.61 (1.05)	4.00 (.72)	2.69**	-2.11**
Predicting financial distress ^d	3.94 (.92)	4.17 (.81)	1.68*	-1.62
Predicting timing and amount of future cash flows ^d	3.83 (1.11)	3.45 (1.23)	-2.01**	-1.98**
Evaluating capacity to adapt to changing conditions ^e	3.44 (.88)	3.29 (1.06)	-.92	.99

Note: Standard deviations in parenthesis. ^a Liquidity and solvency evaluation. ^b Performance evaluation. ^c Monitoring evaluation. ^d Prediction functions. ^e Capacity to adapt. Lower mean scores indicate lower ratings of agreement (i.e., 1 = Strongly disagree; 5 = Strongly agree). **p* < 0.1, ***p* < 0.05, ****p* < 0.001.

decision functions of the CFS relatively more highly than LOs. All other decision categories were rated comparably by the two user groups.

Also relevant to evaluating user assessments of the CFS are comparisons of decision contexts *within* the LO and FA groups. Statistical testing (using one-way ANOVA, combined with Duncan's *post hoc* test) revealed that LOs rated prediction functions of the CFS relatively more highly than all other decision categories. This was followed by (in order of importance) ratings of: liquidity and solvency evaluation; capacity to adapt to changed conditions; monitoring functions; and performance evaluation factors. Similar procedures revealed FAs rated decision contexts differently from LOs. Financial analysts rated liquidity and solvency evaluation as the most important decision category of the CFS. This was followed by (in order of importance) ratings of: prediction functions; monitoring functions; performance evaluation; and capacity to adapt to changed conditions.

Some important conclusions emerge. First, while there were clearly differences in ratings by LOs and FAs, it is noteworthy that liquidity and solvency and prediction

functions were rated as the two most important functions of the CFS by both LOs and FAs. Jones *et al.* (1995, p. 121) used the same procedures to analyse managerial ratings of the decision contexts of the CFS. The only major difference in findings was that internal managers rated performance evaluation and monitoring tasks of the CFS more highly than LOs and FAs. However, the many similarities between Jones *et al.* and the present study indicate a consensus of opinion among financial statement preparers and users about the relevance of the CFS and the particular decision contexts for which the document is most useful.

A second conclusion is that, contrary to well-held beliefs, FAs appear to be an equally significant, if not greater user of the CFS than LOs. It is surprising that FAs rated the CFS more highly than LOs on a number of liquidity and solvency factors. This result was unexpected insofar as the literature strongly associates the relevance of the CFS with the lender-solvency focus (see, for example, Heath, 1978). Furthermore, the literature indicates a fundamentally different decision focus between LOs and FAs (Abdel-Khalik, 1973; Estep, 1987; Heath, 1987; Gup and Dugan, 1988; Kisting and Morsman, 1992; Eastman, 1993). Broadly speaking, LOs have a liquidity and solvency focus, being primarily interested in a firm's ability to repay loans. Financial analysts, on the other hand, tend to have a financial results or profitability focus, being primarily concerned with portfolio decisions and investment appraisal (see San Miguel and Stephens, 1982).

Potential explanations for our results are now discussed. First, possibly there exists a greater degree of homogeneity in the cash-flow information needs and decision foci of LOs and FAs than is presently suggested by the literature. It has long been known that investment decisions based on profitability assessments which do not adequately consider the liquidity and solvency (financial risk) of firms could be disastrous. A similar scenario could occur if loan decisions are confined to liquidity assessments without consideration of a firm's ability to repay debt through profitable operations.

A second explanation relates to changed commercial conditions in Australia which might have caused FAs to become more conscious of facets of company performance which extend beyond shorter term fixations with financial results measures (e.g., rate of return, NPV). Following the dramatic increases in the number of failed and financially distressed Australian firms during the late 1980s and early 1990s (see Lyons, 1991; Lawson, 1991; Clarke *et al.*, 1997), together with nationwide economic decline and domestic investment shrinkages, it is plausible that FAs are now under greater pressure to recognise the soundness of a firm's liquidity and solvency to be an integral factor in the investment decision-making process.

These issues require further research. What is clear is that the present results indicate that FAs have emerged as a key user group of the CFS.

CONCLUSIONS

Examining user evaluations of the CFS provides a test of the financial statement's decision-making relevance. It assists in evaluating the Australian Accounting Standard Board's policy initiative to replace the funds statement with the CFS. The

results are both intuitive and counterintuitive. While the favourable ratings of the CFS by LOs was expected, the relatively higher ratings of the document by FAs, particularly in relation to liquidity and solvency factors, was unexpected. The data demonstrate that the conventional lender-solvency focus of the CFS is overly restrictive, and might need to be reappraised. This conclusion is strengthened when consideration is given to the managerial evaluations of the CFS reported by Jones *et al.* (1995). While the need for more research is recognised, the combined results of both studies indicate that the CFS is likely to fulfil the characteristics of a general purpose document, having the capacity to meet the information needs of a range of users across a large number of decision contexts, particularly liquidity and solvency factors, prediction contexts, monitoring tasks and performance evaluation.

This work suggests that many of the claimed benefits of the CFS to different user groups (see Neill *et al.*, 1991; Lee, 1993) are likely to be justified, but it would be erroneous to conclude that the CFS has usurped the role or function of conventional financial reports. Respondents indicated overwhelmingly that the CFS was most relevant for decision making when used in conjunction with both the profit and loss statement and balance sheet.

Finally, several opportunities exist for research in this area. For example, many of the issues and problems associated with the profit and loss statement and the balance sheet in past decades could have interesting parallels with the CFS. For instance, potential refinements in the definition and classification of cash-flow items (e.g., operating, investing and financing activities) would be a worthwhile area of future research, particularly in view of the primary importance users attach to the operating cash-flow figure as a measure of business performance (Lee, 1993). For the same reason, it is relevant to determine whether and how to standardize the treatment of key cash-flow items (e.g., interest paid, taxation expense). The refinement and testing of improved CFS reporting formats in assisting decision making requires further analysis. Given certain limitations associated with surveys, it is also recommended that there be the use of different methods, such as experiments and case studies, in order to identify CFS users and the manner and context in which the CFS is used for both external and internal decision making.

REFERENCES

- Abdel-Khalik, A. R., 'Detailing Financial Information and the Loan Decision: An Empirical Study', *Journal of Commercial Bank Lending*, April 1973.
- Clarke, F. L., G. W. Dean and K. J. Oliver, *Corporate Collapse: Regulatory, Accounting and Ethical Failure*, Cambridge University Press, 1997.
- Climo, T. A., 'Cash Flow Statements for Investors', *Journal of Business Finance and Accounting*, Autumn 1976.
- Eastman, K., 'Credit Analysis: Gaining Insights from the Statement of Cash Flows', *Commercial Lending Review*, Spring 1993.
- Estep, T., 'Security Analysis and Stock Selection: Turning Financial Information into Return Forecasts', *Financial Analyst's Journal*, July/August 1987.
- Fulmer, J. G., T. A. Gavin and W. J. Bertin, 'What Factors Influence the Lending Decision: A Survey of Commercial Loan Officers', *Commercial Lending Review*, Winter 1991.

DECISION RELEVANCE OF CASH FLOWS

- Griffin, P. A., *Usefulness to Investors and Creditors of Information Provided by Financial Reporting*, Financial Accounting Standards Board, 1987.
- Gup, B. E., and J. Dugan., 'The Cash Flow Statement: The Tip of an Iceberg', *Business Horizons*, November/December 1988.
- Hackel, K. S., and J. Livnat, *Cash Flow and Security Analysis*, USA Book Press, 1991.
- Heath, L. C., 'Financial Reporting and the Evaluation of Solvency', *Accounting Research Monograph 3*, American Institute of Certified Public Accountants, 1978.
- , 'Reply Article', in S. Zeff and T. Keller (eds), *Financial Accounting Theory: Issues and Controversies*, McGraw-Hill, 1987.
- Henderson, J. W., and T. S. Maness, *The Financial Analyst's Deskbook: A Cashflow Approach to Liquidity*, Van Nostrand Reinhold, 1989.
- Ingram, R. W., and T. A. Lee, 'Information Provided by Accrual and Cash-Flow Measures of Operating Activities', *Abacus*, September 1997.
- Jones, S., R. C. Romano and K. S. Smyrnios, 'An Evaluation of the Decision Usefulness of Cash Flow Statements by Australian Reporting Entities', *Accounting and Business Research*, Spring 1995.
- Kisting, S., and J. Morsman, Jr, 'Commercial Lending: Reap the Rewards from Risk Reduction', *Banker's Monthly*, August 1992.
- Lawson, G. H., 'Distributable Profits and Dividends', *Management International Review*, July 1972.
- , 'Memorandum Submitted to the Inflation Accounting Committee in July 1974', *Working Paper Series 12*, Manchester Business School, 1975.
- Lawson, M., 'AARF Hastens to Enforce Cash Flow Standard', *Financial Review*, 6 March 1991.
- Lee, T. A., 'Goodwill—an Example of Will-o'-the-Wisp Accounting', *Accounting and Business Research*, Autumn 1971.
- , 'The Relevance of Accounting Information Including Cash Flows', *The Accountant's Magazine*, January 1972a.
- , 'A Case for Cash Flow Reporting', *Journal of Business Finance*, Summer 1972b.
- , 'The Cash Flow Accounting Alternative for Corporate Financial Reporting', in C. van Dam (ed.), *Trends in Managerial and Financial Accounting*, Martinus Nijhoff, 1978.
- , 'A Survey of Accountants' Opinions on Cash Flow Reporting', *Abacus*, September 1981.
- , 'Funds Statements and Cash Flow Analysis', *The Investment Analyst*, June 1983.
- , (ed.), *Cash Flow Reporting: A Recent History of an Accounting Practice*, Garland, 1993.
- Lyons, M., 'Renewed Interest in Cashflow', *Business Review Weekly*, July 1991.
- McEnroe, J., 'Cash Flow Accounting Revisited: A Note on a Partial Replication of the Lee Study', *Abacus*, March 1989.
- , 'An Examination of Attitudes Involving Cash Flow Accounting: Implication for the Content of Cash Flow Statements', *The International Journal of Accounting*, Vol. 31, No. 2, 1996.
- Neill, D., T. Schaefer, P. Bahnson and M. Bradbury, 'The Usefulness of Cash Flow Data: A Review and Synthesis', *Journal of Accounting Literature*, Vol. 10, 1991.
- Nunnally, J. *Psychometric Theory*, McGraw-Hill, 1978.
- Rappaport, A., 'Cash Flow Analysis of Corporate Performance', *Finance: A Guide to Creating Shareholder Value*, November 1988.
- San Miguel, J. G., and R. G. Stephens, 'Preferences for Financial Information Among Users: Some Evidence and Suggestions for Research', *Quarterly Review of Economics and Business*, Winter 1982.
- Sondhi, A. C., G. H. Sorter, V. C. Ross and G. I. White, 'Cash Flow Redefined: FAS 95 and Security Analysis', *Financial Analyst's Journal*, November/December 1988.
- Walker, R., and S. Robinson, 'Competing Regulatory Agencies with Conflicting Agendas: Setting Standards for Cash Flow Reporting in Australia', *Abacus*, March 1994.
- Wilson, P. G., 'The Incremental Information Content of the Accrual and Funds Components of Earnings After Controlling for Earnings', *The Accounting Review*, April 1987.

MAXWELL AIKEN AND WEI LU

The Evolution of Bookkeeping in China: Integrating Historical Trends With Western Influences

This article reviews the development of Chinese single-entry bookkeeping, the emergence of Chinese double-entry bookkeeping and evolutionary trends from single entry to double entry. It identifies the invention and basic nature of Chinese double-entry methods which have reflected cultural changes from within the society. Given this historical perspective, conclusions are drawn about the nature of social and economic change in China and the impact of outside cultural influences. Of particular importance to the timing of progress is the primitive form of double entry entitled Three Feet. This had its gestation about the same time as European innovations were occurring in response to economic and cultural changes which sponsored bookkeeping methods as described by Pacioli. A critical question for examination at present is whether cultural evolution in China can yet support complete integration of its own accounting principles and fundamental philosophies with Western accounting methods. This has proved to be difficult in the past.

Key words: Bookkeeping; China; History; Integration; Western Accounting.

Guo (1988) has presented an analysis of the historical contributions of Chinese accounting to international accounting. Following the views of Parker (1993), Holzer (1984) and Yamey (1978, 1982) about historical research requirements outside Europe, the U.S.A. and the U.K., a number of writers in China and overseas are now attempting to publish works about early Chinese accounting developments in order to improve knowledge of the nature and incidence of change (e.g., Fu, 1968, 1971; Jong, 1972; Guo, 1984; Lin, 1992; Aiken and Lu, 1993a, 1993b).

Chinese bookkeeping methods have evolved over two thousand years, during which time they have incorporated many innovations. These methods have moved gradually from single entry to double entry. The first complete single-entry bookkeeping system was almost certainly invented during the Western Zhou Dynasty (1100–771 bc). It was then developed further over the course of two millennia under a feudal society. As improvement reached its late period of accomplishment in the Ming and Qing Dynasties (AD 1368–1911), certain unique cultural features were emerging which were to be widely expressed in Chinese society.

MAXWELL AIKEN is Professor of Commerce and Deputy Head of School of Business, La Trobe University, and WEI LU is a Lecturer, Department of Accounting and Finance, Monash University.

The Ming Dynasty, between the fifteenth and sixteenth centuries, was the catalyst of the development of a commodity economy. In commerce and banking, economic activities tended to become more complex with increased capital underpinning businesses (Meng, 1957). To reflect this, a Chinese double-entry framework emerged using the Longmen and the Four Feet bookkeeping systems. A change from single to double entry had actually occurred three centuries before the First Opium War of 1840, which signalled the beginning of China's modern era. After 1840 Western double-entry systems were introduced to China and limited reforms to intrinsic bookkeeping methods ensued.

Certain processes of the evolution of bookkeeping will be studied sequentially after the better known and dramatic revolutionary effects of Western influences from 1840 to 1996 are briefly examined. Interpretation of the likely impact of the Western influence as a whole for the integration of Western and Chinese accounting systems appear subsequently. The potential Western impact on Chinese accounting in general will be assessed only after long-run evolutionary trends have been examined with respect to China's dynastical feudal society. This historical icon of China reflected and influenced cultural developments for some thousands of years. It is speculated that some resulting cultural impediments to overseas innovations for accounting may still be influential in China today.

WESTERN BOOKKEEPING AND CHINESE REFORMS

Many historians (e.g., McAleavy, 1967; Hsu, 1975) believe that 1840, the year the Chinese were defeated in the First Opium War, marked the beginning of the modern era. An alternative view selects the sixteenth century, in which European explorers (e.g., Marco Polo, 1533) and missionaries first visited China (Li, 1961). The reason for rejection of the earlier period is that this association did not fundamentally disturb the political and social fabric of China. Defeat in the Opium War was different. From then on China began to sink from the level of a great empire to semicolonial status. Thereafter, ancient feudal foundations were rapidly eroded by the power of capitalism (Su, 1985).

After 1840 Western debit-credit style double-entry bookkeeping was first used in the Customs department, the railways and the postal services. Private-sector reform was initially carried out in the banks and then in industry. The further introduction of Western accounting in the 1920s and 1930s reformed Chinese accounting and settled directions for its future development which persisted until the 1949 revolution.

Initial Use of Western Bookkeeping in China

Initially, Western accounting was used mainly by foreigners (Zheng, 1986). In 1845, the Customs administration was taken over by the colonists. Ten years later, H. N. Lay was appointed head of the taxation section of the national Customs department. From 1860 this office began to use Western bookkeeping methods and to present financial reports regularly according to the Gregorian calendar.¹ This was

¹ Traditionally, financial reports were made according to the Chinese lunar calendar.

the first instance of modern Western accounting being used in China (Wei, 1984). Such methods were also adopted by the railways administration.

In 1878, the government of the Qing Dynasty entrusted the chief of the customs tax section, R. Hart, with the founding of the Chinese post office. All accounting methods used there were Western in orientation. In 1897, having asked the government to allocate funding and having obtained business investment monies, Xiun-Hue Shen founded the Chinese Commercial Bank. A. M. Mailand, who had been manager of the British Bank, was appointed manager and H. B. Marshall chief accountant. The accounting methods used were once again Western in origin and practice.

Recording was done in foreign languages although these enterprises were in fact controlled by the Chinese government. As well as having an accounting department, each entity had a translation department which was responsible for the translation of 'foreign accounts' and for transposition into the Chinese form of accounting. This was called the Four Column report. Thus, it can be said that the use of Western accounting was at that time passive, at least as to form.

Further Developments of Western Accounting in China

This initial use of Western accounting did not imply that it had been fully embraced in China. It was mainly used by foreigners and was not at that time enthusiastically taken up by the Chinese themselves. However, attitudes changed to a degree after the publication of Xi-Yong Cai's *Lian Huan Zhang Bu* (Chain Accounting System) in 1905.² Xi-Yong Cai referred to the Italian double-entry system as a chain accounting system and his was the first indigenous book introducing Western double-entry accounting thought of the Pacioli vein.

Also, Xi-Yong Cai created a new bookkeeping method using the principles of debit and credit in the double-entry framework coupled to traditional Chinese bookkeeping. This method retained the Chinese recording symbols *Gai* and *Cun*, as 'debit' and 'credit' in Western accounting, according to the principle: *Gai* and *Cun* must appear at the same time, and must be 'equal'. It also retained the traditional Chinese vertical recording system. *Cun* was at the top and *Gai* below. This amalgam greatly influenced Chinese bookkeeping methods at that time.

Western Accounting Methods in Banks and Government

In 1908 the government Hubu bank was replaced by the Daqing bank. A number of Chinese who graduated in Japan joined the establishment of the Daqing bank and advocated the use of Western accounting. The government agreed to this suggestion and set up a school to train accountants in the use of the new bank accounting methods. However, few people had any knowledge of Western accounting and refused to use it. Also at that time the Qing Dynasty was overthrown by the Xinhai revolution and replaced by the Republic of China.³

² This opinion is widely accepted by Chinese accounting historians, e.g., Dao-Yang Guo (1986).

³ The Republic of China was established in 1911. Dr Sun Yat-Sen was its president.

In 1912 the government of the Republic of China founded the Bank of China using the format of the Daqing Bank. Lin Xie was nominated as chief accountant and set out to reform bank accounting. Li (1982) suggests that by 1916 the accounting methods used in the Bank of China had become Western in nature and the old bookkeeping systems of China had been abandoned.

In the late 1920s and early '30s Jia-Yuan Yong, chief accountant in the Treasury department of the government, set out to reform government accounting. Government reforms had begun with the Ming Shan Accounting Law, which was officially promulgated by the Warlords government (1912–27) on 2 October 1914. Ming Shan was mainly a copy of Japanese accounting law which itself had been influenced by German law and practice.⁴ In 1915 the audit department of the Warlords government drew up financial regulations and in the same year issued guidelines entitled *General Government Bookkeeping*. From then on the government had its own regulations. This was an early instance of Chinese accounting academics and professionals being involved in regulating Chinese government accounting. In July 1932, the government of the National Republic officially promulgated its *Unified Government Accounting System*. These regulations contained a complete description of the government accounting system. They identified the classification, form and filing methods for source documents. Also, they prescribed the use of journals and the postings from the journal to the recording of the ledger together with financial reporting requirements. On the basis of the above regulations the government promulgated *Accounting Regulations for all Government Agencies* (1938) as the basis of accounting systems. The main achievement of those regulations was to encourage people to use debit–credit double-entry bookkeeping instead of cash receipts and disbursements double-entry.

In the initial period after the success of accounting reforms in banking, accounting professionals began to advocate the use of Western accounting and the phasing out of Chinese bookkeeping (Gao, 1985). Critically, at that time, Yong-Zhe Xu became chief editor of *The Banking Weekly*. Here, a special column was devoted to accounting research. This advocated the use of Western accounting and the complete reform of Chinese accounting. However, many people still suggested that indigenous Chinese accounting should be retained and questioned the need for reform and the benefits to be gained. As a consequence only a comparatively few accounting professionals joined in the push for Western accounting reforms.

In 1922 Yong-Zhe Xu advocated the use of Chinese accounts books to be used in conjunction with all Western double-entry accounting systems, thus avoiding the need for expensive imported accounts books. As mentioned earlier, one difference between Chinese and Western bookkeeping is that the former uses a top and bottom form of ledger, together with Chinese numerals, while the latter uses a multiple-column form of ledger and a subsidiary ledger, both written in Arabic numerals. In 1925 Yong-Zhe Xu suggested the adoption of cash receipts and disbursements as

⁴ Germany has had a profound influence in Japan. E.g., the Japanese commercial code is based on the German commercial code of the nineteenth century. However, the German influence has diminished over time and has been replaced by the United States since the immediate post-World War II occupation of Japan under the rule of Douglas Macarthur (Nobes and Parker, 1995).

double-entry systems while allowing accountants to use whichever form of accounts and whichever numerals they preferred. *An Outline of Chinese Accounting Reform* (Xu, 1933) was later published and between thirty and forty standard forms of accounts books were printed. By 1934 some schools had introduced such accounting reforms into their curriculum.

Introduction of Soviet Union Accounting Systems and the Formation of Some Bookkeeping Methodologies (1949–79)

Comparable to U.S. influence on Japanese accounting post World War II, the influence of the Soviet Union on the foundation of the People's Republic of China in 1949 resulted in its economic structure following the principles of the Soviet Union primarily through the introduction of central planning. The capitalist enterprises of the economy were gradually replaced by state-owned and collective ones. State-owned enterprises were considered to be leading forces for socialism in a socialist country. Therefore, all private enterprises were transferred to public ownership. The Ministry of Finance was established as the department to be in charge of accounting affairs and it commenced to enforce uniform accounting systems. Under these systems, classification of accounting for reporting purposes was based on industrial sectors so that there were uniform manufacturing, commercial, agricultural, banking and transportation accounting systems. There was also uniform budgetary accounting for government agencies and for non-profit organizations. Accounting research at that time was focused on translations of Soviet Union accounting theories which attempted to distinguish between the different nature of capitalist accounting and socialist accounting systems.

In 1960, after the catastrophe of the Great Leap Forward⁵ caused by confrontation in the Sino-Soviet relationship and the still cooling relationship with the United States, China advocated a policy of self-reliance. Accounting academics and practitioners tried to create a specific Chinese accounting system, with an emphasis on creating new bookkeeping methods. One ideological reason for this was that debit-credit bookkeeping had been adopted by the United States and other Western countries; therefore it was capitalist. However, it was also adopted by the Soviet Union and therefore revisionist. China, it was thought, should use its own socialist bookkeeping methods. Accounting academics and practitioners tried to revise Western bookkeeping with reference to Chinese traditional bookkeeping, for example, using 'receipt' and 'disbursement' as a recording symbol.

Several alternative bookkeeping methods were proposed, based on traditional Chinese bookkeeping methods. Of these, the increase-decrease method and receipt-disbursement method were the most popular and practicable. An increase-decrease

⁵ The infamous campaign of the Great Leap Forward was launched by Mao Zedong in February 1958, calling for a doubling of output within one year. In Mao's philosophy, the creativity and talent of the masses were unlimited. If the abilities of the masses could be liberated and encouraged, they could create miracles. Therefore all the regulations should be abolished. This caused a great catastrophe.

During that period, debit-credit double entry was used in all profit and not-for-profit organizations. Because this method was imported from the Soviet Union, and was labelled as a socialist method, nobody at that time challenged whether or not this method was suitable for China.

method was implemented first in state-owned merchandise enterprises, and afterwards adopted by small manufacturing enterprises because it was considered easy to learn. Wei (1984) notes that the receipt-disbursement method continued to be used by governmental units and social organizations for many years.

Post-Economic Reform Innovations

Economic reforms since 1979 have produced far-reaching accomplishments that are attracting attention worldwide. The development of accounting has occurred, but it has slightly lagged the economic reforms (Zhou, 1988; Ji and Lu, 1992). In 1992 the first Chinese Accounting Standard for Enterprises (Ministry of Finance, 1992) was promulgated, effective from 1 July 1993. It was a landmark in accounting reform, indicating that Chinese accounting practitioners and scholars had begun to make use of international accounting standards and Western experience to direct further reforms. Following that, the Certified Public Accountants Act 1993 (Ministry of Finance, 1993) was promulgated by the Fourth Session of the Standing Committee of the Eighth National People's Congress, thus providing another step in China's internationalization of accounting practices.

China had not developed its own accounting standards in the previous forty-odd years. Accounting practice had been governed by Soviet-style uniform accounting systems and regulations which differed from international accounting practices and standards. Hence, the promulgation of new accounting standards has brought many changes in accounting practice.⁶ One of the major changes is with respect to bookkeeping methods. Through these standards, the Chinese accounting authorities have unified double-entry bookkeeping methods to be used in enterprises for the first time. Article 8 of the standard states that 'all enterprises should use the Debit-Credit double-entry method'. This article indicates that merchandise enterprises and small manufacturing enterprises, which previously applied the increase-decrease style double-entry bookkeeping method, shall now adopt debit-credit methods.

The major reason for change was that different bookkeeping methods were perceived to create obstacles in the communication of accounting information, potentially acting as a brake on the rapidly growing economy, and also disturbing foreign investment. Although double-entry bookkeeping methods have been unified in commercial and industry sectors, governmental sectors are still using receipt-disbursement methods of bookkeeping. We speculate that reflects the idea that China should establish an international accounting system compatible with its own culture. The use of a diversity of bookkeeping methods is a symbolic characteristic of Chinese accounting and has deep roots in the cultural heritage of accounting in that country.

Evolutionary Prognosis of Future Trends

Problems associated with the integration of bookkeeping systems in China under Western influences constrained by traditional customs have been prevalent over the

⁶ The first accounting standard—Accounting Standard for Enterprises—was promulgated by the Ministry of Finance in 1992. It includes ten chapters and sixty-six articles. It was the first attempt by the Chinese to internationalize their accounting practices.

past 150 years. Is there any hope for complete reconciliation? This question will be interpreted after evolutionary trends from China's dynastic periods have been considered. If the reconciliation of bookkeeping rules and related accounting methods with the Western paradigm is *not* in fact 'hoped for' under Chinese cultural traditions, then issues of 'efficiency' and internationalization may fail to unify accounting principles and auditing procedures within the country, given its disparate cultural foundations (cf Perera, 1985). The following identification of evolutionary patterns may help to reveal opportunities for the development of Western accounting ideas still needing to be shaped by cultural imperatives which have been well documented in Chinese history.

CHINESE SINGLE-ENTRY BOOKKEEPING

As mentioned previously, Chinese single-entry bookkeeping has developed slowly over thousands of years since being devised in the Western Zhou Dynasty. From these beginnings the evolutionary characteristics of Chinese single-entry bookkeeping are apparent. Following Lu (1992), the development of Chinese bookkeeping may be divided into four periods.

Formative Period in the Western Zhou Dynasty (1100–771 BC)

The single-entry bookkeeping method was first used in government accounting.⁷ Before the Western Zhou Dynasty, the account book took the *Cao Liu* form, a type of day book. In the Western Zhou Dynasty the account books had two forms, *Cao Liu* and *Zong Qing* (Guo, 1986). *Cao Liu* was used to record transactions very roughly as they occurred, and subsequently they were recorded in *Zong Qing* according to transaction categories based on account titles. In government accounting the account titles were usually named after the financial revenue and expenditure items. Chinese *Ru* (in) and *Chu* (out) were the designated recording symbols. Perhaps because of the lack of a single stable monetary unit, accounting entries in the two books were quite descriptive and the inventories were explained in their weight and size instead of monetary value. The Three Column method was used to calculate ending balance. The formula for this was:

$$\text{New receipt} - \text{Amount paid out} = \text{Ending balance}$$

The Developing Period in the Qin and Han Dynasties (221 BC–AD 221)

During these dynasties, non-government accounting became separated from government accounting and developed independently because of economic change. The emperors of the Qin Dynasty had unified the nation and had also standardized writing characters and introduced a currency unit and a system of weights and measures. In the Qin Dynasty the Chinese *Shou* (receipt) and *Fu* (disbursement) were used as recording symbols in non-government accounting, while *Ru* and *Chu* remained in use for government accounting. Besides personal accounts, some sales,

⁷ In China, government initiatives in accounting have usually occurred earlier than for non-government accounting.

expenditure and profit type accounts were used. Also, accounts receivable and accounts payable classifications were designed at this time (Guo, 1988). Because of the unification of currency, the value of the goods was recorded in addition to the entries in terms of the size and weight of goods. By the end of the Eastern Han Dynasty (AD 25–221); paper had been invented and was being used for keeping accounts, while in the same period use of the abacus had become popular.

The Mature Period in the Tang and Song Dynasties (618–1279)

Eberhard (1960) recounts that, in the history of Chinese feudal society, the Tang and Song Dynasties provided the golden age. During this period, an emphasis upon agriculture, manufacturing and commerce achieved relatively high rewards and also created a demand for accounting. The Four Column method for calculating ending balances emerged in the Tang Dynasty and became popular in the Song Dynasty. The basic equation was:

Balances brought forward + New receipts – Amounts paid out = Balance in hand

In the Tang and Song Dynasties, the Chinese *Ru* and *Chu*, *Shou* and *Fu* were used in both government and non-government accounting enterprises. Accounting reports were required at a regular time, that is, daily, monthly, quarterly and yearly. They were also required in a regular form and were usually in four columns: Balance carried down, New receipts, Amounts paid out and Balance in hand.

The Period of Wide Use of Chinese Single-Entry Bookkeeping in the Ming and Qing Dynasties (1368–1911)

During the Ming and Qing Dynasties Chinese single-entry bookkeeping still dominated recording for society, even though Chinese double-entry bookkeeping had been invented over this 500-year period. Compared with its primitive period in the Western Zhou Dynasty, Chinese single-entry bookkeeping now had the following evolutionary features in the form of its primary books of account:

1. *Cao Liu*, also called *Ben Zhang*, *Cao Pi*, *Di Bu*, *Di Zhang*, was used to keep records when a transaction occurred. It played the role of source document.
2. *Xi Liu*, also called *Ri Liu*, *Qing Liu*, *Er Liu*, *Zong Chen*, was usually updated from *Cao Liu*, item by item, at the end of each day with a total required at the end of every ten days, every month and every year.
3. *Zong Qing*, also known as *Teng Qing Zhang*, *Zong Bu*, *Zong Zhang*, was used to classify and summarize business activities and transactions for a specific period. It was posted from *Xi Liu* and was used to keep the records of economic activities. This provided the evidence for any financial statements (*Hong Zhang*) and was the basis for the calculation of cost, profit and loss.

The accounting cycle from *Cao Liu* to *Hong Zhang*, a form of Chinese financial statement, is as shown in Figure 1. This may be compared with Figure 2—the Western system in which three types of account book were in use before the Middle Ages (Chatfield, 1977).

FIGURE 1

THE ACCOUNTING CYCLE FROM CAO LIU TO HONG ZHANG

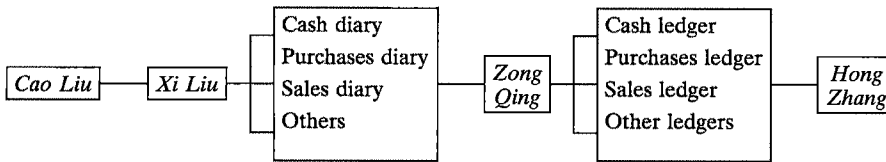
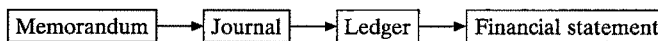


FIGURE 2

THE ACCOUNTING CYCLE: MEMORANDA TO FINANCIAL STATEMENTS



The systems of East and West had similarities and differences:

1. *Cao Liu* in Chinese accounting is the same as memoranda in Western accounting, in that both can perform the role of source document.
2. *Xi Liu* in Chinese accounting has long been different from the journal in Western accounting. It comprises only the rewriting of *Cao Liu* while Western accounting has the required journal entries using debit and credit as a double-entry system.
3. *Zong Qing* in Chinese accounting has been the same as the ledger in Western accounting, in that both classify the effects of transactions on each individual account. Account titles were in two categories: *Cun* (assets) and *Gai* (liabilities/owner's equity).

Both *Cun* and *Gai* have subsidiary items, and some subsidiary items have their own sub-items.

The *Shou* and *Fu* single-entry method was based on cash flows. *Shou* means a cash inflow and *Fu* represents a cash outflow. Under this method there have been two parts; the first being *Shou* and the second *Fu*. In *Cao Liu*, columns were not made by drawing lines but by pleating a paper to make eight vertical lines. Each column records one transaction. *Sou* items were written on the top half of the sheet and *Fu* items were written on the bottom half. In *Xi Liu*, columns were made by drawing lines so that a line drawn across the middle of the paper horizontally and several lines are drawn from top to bottom. One transaction is recorded between the two vertical lines. *Sou* items were recorded above and *Fu* items were recorded below the horizontal lines. Chinese numbers were used in recording the transactions. In *Zong Qing* another special sheet was used. It had a horizontal line on the top and bottom of the page, two lines drawn across the middle of the paper and several vertical lines. The date was written just below the top line and transaction amounts were written above the bottom line.

Using the Four Column method to calculate an ending balance was a widely used practice in governmental and private accounting in the Ming and Qing Dynasties (Gao, 1985). Four Column means four items, these being Balance carried down, New receipts, Amount paid out and Balance in hand. When balancing the accounts, all items were classified into four categories. The basic equation was:

Balances brought forward + New receipts – Amounts paid out = Balance in hand

In actual use the equation could be changed into the balancing equation:

Balance brought forward + New receipts = Amounts paid out + Balance in hand

or else into a differential equation:

New receipts – Amount paid out = Balance in hand – Balance brought forward.

These equations were used to check whether the recording of accounts was correct. This then became the basis of financial reporting and also the basis of government accounting. By checking, government income and outgoings must balance. The Four Column method was accepted to be the scientific accounting method and was used for thousands of years.

Prior to the establishment of the Republic of China in 1911, government accounting relied on a Four-Column accounting report. It required the listing of four items which were: Balance brought forward, New receipts, Amount paid out, and Balance in hand. This format had first appeared in the Tang Dynasty. In non-government accounting the *Hong Zhang* report was required at the year's end. In Chinese, *Hong* means profit and *Zhang* means account book. At the Chinese new year people usually distribute the *Hong* which is calculated on the *Hong Zhang*. If the amount of *Cun* exceeded *Gai*, a profit was made.

In late feudal society the single-entry framework was suitable for the self-sufficient economy. This had developed over a long period up to the late Qing Dynasty and was a comparatively complete accounting system. Development of industry and commerce was very slow under the feudal system. Most businesses were operated by single owners and were very small. As a consequence, businesses did not make complicated cost calculations and the government did not require financial reports. Government taxes were levied mainly from agriculture with a minimal take from business. Accountants at that time calculated for owners the extent of profit or loss. However, with the subsequent development of the economy it became obvious that the traditional single-entry framework would no longer suffice.

CHINESE DOUBLE-ENTRY BOOKKEEPING

It has been widely accepted that double entry was initiated in Italy during the thirteenth century (de Roover, 1956; Peragallo, 1983; Parker, 1984). The method summarized by Luca Pacioli in 1494 was translated for use in other countries (Nobes, 1984). It is argued by some accounting historians, including Lin (1992), that it is 'insufficient to assert that double-entry bookkeeping was solely invented in Italy because there is much evidence to suggest that a double-entry method was in use in China around the turn of the sixteenth century' (p. 104).

In the Ming Dynasty (approx. AD 1650) the development of a commodity economy and the strengthening of commerce, banking and economic activities induced complexity. It featured capital formation and complex business relationships. Wei (1984) notes that Chinese double-entry frameworks known as the Longmen and the Four Feet bookkeeping systems emerged in this era. They had been preceded by the Three Feet bookkeeping system.

The Three Feet Bookkeeping System

The change from single entry to double entry was gradual. Movement flowed from single entry to an intermediate framework between single and double entry and finally to double entry. The intermediate framework—the Three Feet bookkeeping system—was based on the single-entry framework, but there was a difference as it used a form of double entry for non-cash transactions. For example, if inventory (silk) was used to pay ‘accounts payable—B firm’, then the transaction would be recorded as:

Receipt: silver from silk

Disbursement: silver to B firm

The underlying theory of traditional Chinese bookkeeping is cash, in ancient times called silver (*Yin*), movement. Here the receipt line shows the decrease of inventory and the disbursement line shows the decrease of debt. If cash is paid for buying tea a record would be required of one side only, and the transaction would appear as:

Disbursement: silver to the purchasing of tea

This was known as the Three Feet for bookkeeping because the double-entry for a non-cash transaction represented two feet, while the single-entry for cash only represented one foot. A cash diary was used to record cash increases and decreases from which, using a Four Column method, the cash balance on hand could be obtained and then checked with the actual cash on hand. The Three Feet bookkeeping system was the medium through which the Chinese double-entry framework evolved, as is examined below.

The Longmen Bookkeeping System

The Longmen bookkeeping system originated about the middle of the seventeenth century⁸ (at the end of the Ming and the beginning of the Qing dynasties). There were at that time three account books. These were *Cao Liu*, *Xi Liu* and *Zong Qing* for the Longmen bookkeeping system. The *Zong Qing* accounts were the key accounts from which financial reports were prepared. In comparison with the Three Feet system and the single-entry framework, the three main advantages of Longmen were:

1. *Sou* and *Fu* were used as recording symbols according to the principle: The *Sou* appears with the *Fu*, and the two amounts are equal. This is required to record a dual entry for every transaction.
2. All account titles were grouped into four categories: Receipt, Payment, Keeping and Owing. Each had a number of sub-items in each category. Receipts

⁸ According to historical records, this method was created by Fu Shen, a merchant in Shansi Province. But explanation of why and how he created it is still to be provided.

and payments categories were particularly important because they were the basis for calculating profits.

It should be pointed out that the account categories used in Longmen are different from the accounts in use today. The items in Longmen are not classified in terms of the transaction contents but in terms of the results of business activities. In the Longmen system 'Receipt' reports all the income which a business makes and 'Payment' represents all the expenses. 'Keeping' represents the increase of assets while 'Owing' represents an increase of liabilities.

Sometimes the same transaction contents could be recorded in different categories:

1. Purchase of a commodity with silver on deposit with bank A. This is recorded as:
 Receipt: silver from bank A (Owing account)
 Disbursement: silver to inventory (Keeping account)
2. Receipt of silver from sale commodity, and deposit in bank A. This is recorded as:
 Receipt: silver from sale (Receipt account)
 Disbursement: silver to bank A (Keeping account)

The cash amounts in the two examples are recorded as different items. Silver at bank when received is recorded under the Owing item; when paying it is recorded under the Keeping item. Given the use of the debit/credit double-entry system the first example would be recorded:

Dr: inventory	(Assets account)
Cr: cash at bank	(Assets account)

The second example would be recorded as:

Dr: cash at bank	(Assets account)
Cr: revenue	(Revenue account)

In the Longmen system, the method of classifying the items makes the recording direction consistent with the recording item. Receipt and Owing items are always recorded under *Sou*, the first part of the ledger; Keeping and Payment are always recorded under *Fu*, the second part of the ledger. This follows the usual form for the Chinese ledger in which *Sou* appears on the top of the paper and *Fu* on the bottom.

Another four examples are now given to illustrate recordings under Longmen (units in tale of silver):

1. Purchase commodity from X factory without payment of money:
 Receipt: silver from X factory (Owing account) 100
 Disbursement: silver to inventory (Keeping account) 100
2. Sell commodity, deposit in A bank
 Receipt: silver from sale (Receipt account) 250
 Disbursement: silver to A bank (Keeping account) 250
3. Pay fee from silver on hand
 Receipt: silver from on hand (Owing account) 50
 Disbursement: silver to expense (Payment account) 50

TABLE 1
DIAGRAM OF CAO LIU, XI LIU AND ZONG QING IN LONGMEN SYSTEM

龙门帐系统的草流·细流和总清簿示意图



EVOLUTION OF CHINESE BOOKKEEPING

TABLE 1

CAO LIU, XI LIU AND ZONG QING IN LONGMEN SYSTEM (TRANSLATED)

<i>Cao Liu</i>			
1 Receipt: Silver from X factory	100	5 ...	
Disbursement: Silver to inventory	100		
2 Receipt: Silver from Sale	250	6 ...	
Disbursement: Silver to A bank	250		
3 Receipt: Silver on hand	50	7 ...	
Disbursement: to Expenditure	50		
4 Receipt: Silver from Sale	120	8 ...	
Disbursement: Silver to Money receivable—Y Shop	120		
Recording to <i>Xi Liu</i>			
1 Receipt: Silver from X factory	100	1 Disbursement: Silver to Inventory	100
2 Receipt: Silver from Sale	250	2 Disbursement: Silver to A bank	250
3 Receipt: Silver on hand	50	3 Disbursement: Silver to Expenditure	50
4 Receipt: Silver from Sale	120	4 Disbursement: Silver to Money receivable—Y shop	120
Posting to <i>Zong Qing</i>			
Receipt account:		Keeping account:	
2 Receipt: Silver from Sale	250	1 Disbursement: Silver to Inventory	100
4 Receipt: Silver from Sale	120	2 Disbursement: Silver to A bank	250
		4 Disbursement: Silver to Money receivable—Y shop	120
Total:	370	Total:	470
Owing account:		Payment account:	
1 Receipt: Silver from X factory	100	3 Disbursement: Silver to Expenditure	50
3 Receipt: Silver on hand	50		
Total:	150	Total:	50

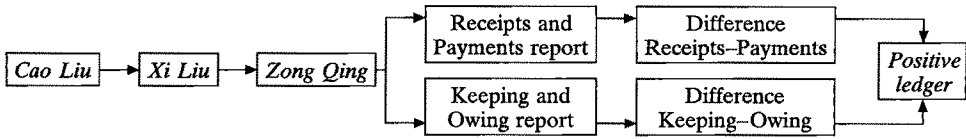
4. Sell commodity to Y shop, money has not been received
- | | | |
|---|-------------------|-----|
| Receipt: silver from sale | (Receipt account) | 120 |
| Disbursement: silver to money receivable—Y shop | (Keeping account) | 120 |

The recording in *Cao Liu* and *Xi Liu* and the posting in *Zong Qing* are shown in Table 1.

3. After Making the Receipts and Payments report and the Keeping and Owing report, both totals are to be checked. Before making these two reports, the total of four items is first calculated: every sub-item of receipts and payments in the Receipts and Payments report is to be listed and the difference between

FIGURE 3

THE ACCOUNTING CIRCLE UNDER THE LONGMEN SYSTEM



receipts and payment is obtained. In the same way, the difference between Keeping and Owning is obtained, and this difference is used to check the calculations of Receipts and Payments as being correct. The equation is:

$$\text{Receipts} - \text{Payments} = \text{Keeping} - \text{Owing}$$

As in the above example:

$$\text{Receipts (370)} - \text{Payments (50)} = \text{Keeping (470)} - \text{Owing (150)}.$$

This matching of the two differences was called *He Longmen*, that is, matching the two sides, and is illustrated in Figure 3.

The Longmen was an embryonic symbol of the emergence of Chinese capitalism with its own characteristics. It represented accounting developments in a period of change and also provided the basis for the later Chinese double-entry framework—the Four Feet bookkeeping system.

The Four Feet Bookkeeping System

The framework for the Four Feet bookkeeping system emerged in the middle of the eighteenth century. Its inventor remains unknown but it is widely used in Yunnan Province (Guo, 1986). The system was also known as the Heaven and Earth Matching bookkeeping system (*Tian Di He Zhang*). Four Feet bookkeeping developed under the influence of the previous Three Feet and Longmen bookkeeping systems. It was, however, more mature in accounting reporting essentials and had the following characteristics:

1. It further developed the 'three types of accounts book' system, classifying *Xi Liu* as the general, cash and purchasing and selling journals, while *Zong Qing* classified receivables and payables, purchasing and selling and other ledgers. Large organizations would further subdivide the classifications.
2. The Four Feet bookkeeping system had the characteristics of both the Longmen and Three Feet bookkeeping systems. Under the Four Feet bookkeeping system for non-cash transactions, the recording principle was: The receiving appears with the paying, and the amounts are equal. There were two methods used for measuring cash transactions. One was the same method as that in the Longmen system which was recorded in double entry. The other was the same as under the Three Feet system. It required the recording of one line when a transaction occurred—the non-cash line—while cash was to be recorded in the cash journal.

TABLE 2

DIAGRAM OF CAI XIAN JIE CE

X silk farm one month profit and loss statement			
1 Silver from sale of red silk	500	1 Silver to salary	280
2 Silver from sale of green silk	350	2 Silver to delivery fee	120
3 Silver from sale of black silk	220	3 Silver to expenditure	60
4 Silver from sale of white silk	50	4 Silver to repair fee	100
5 Silver from sale of flower silk	250	5 Silver to tax	130
6 Silver from other	50	6 Silver to loss	30
Total	1,420	Total	720
		Profit	700

3. Under the Four Feet system calculation of the profit required *Cai Xiang Jie Ce*, a profit and loss statement in which all sales revenue and other revenue according to the classification of goods appeared in the top part of the statement; and all expenses, losses and taxes in the bottom part. There was a profit if the amount in the top exceeded that in the bottom; otherwise, there was a loss. The equation is:

$$\begin{aligned}\text{Profit} &= \text{Receipt (Jin)} - \text{Payment (Jiao)} \\ &= \text{Income} - (\text{Expense} + \text{Loss} + \text{Tax})\end{aligned}$$

This is similar to the profit calculation method in Western countries. Table 2 provides an illustration of *Cai Xian Jie Ce*.

The other accounting report under the Four Feet bookkeeping system is *Cun Chu Jie Ce*. It lists all capital and liabilities at the top of the report and all assets and debits at the bottom. If a profit is made it appears at the top, whereas a loss would appear at the bottom. It was in the form of a standard balance sheet. Under this Four Feet system the top was called *Tian Fang* (Heaven) and the bottom *Di Fang* (Earth). The process of balancing the two was called *Tian Di He* (Matching the Heaven with the Earth). Table 3 is an illustration of *Cun Chu Jie Ce*. The equation is:

$$\begin{aligned}\text{Owing (Gai)} + \text{Profit} &= \text{Keeping (Cun)} \text{ or} \\ \text{Capital} + \text{Creditors} + \text{Profit} &= (\text{Inventory} + \text{Fixed asset} + \text{Cash} + \text{Debtors})\end{aligned}$$

In summary, the change from single to double entry was an evolutionary process beginning three centuries before the Opium War (1840) and, despite many changes during those years, a complete system did not evolve. A single-entry framework was still widely used in the society of the mid-nineteenth century. The method varied from industry to industry and from region to region. Accounting was more advanced in *Jiangsu* and *Zhejiang* provinces than in other regions. Accounting practices used in commerce and banking were more advanced than those used in government and other industries.

TABLE 3

DIAGRAM OF *CUN CHU JIE CE*

X silk farm balance sheet			
Coming:	Heaven	Going:	Earth
1 Silver from investment	5,000	1 Inventory of red silk	850
2 Silver from farm A	600	2 Inventory of green silk	920
3 Silver from farm B	400	3 Inventory of black silk	610
4 Silver from farm C	350	4 Inventory of white silk	580
5 Silver from bank D	650	5 Inventory of flower silk	980
6 Silver from this month's profit	700	6 Silver to bank A	1,400
		7 Silver to tea shop A	600
		8 Silver to tea shop B	520
		9 Silver to cash on hand	350
		10 Silver to cash on hand	890
Total	7,700	Total	7,700
The Heaven and the Earth are matched			

Accounting practices used in commerce and banking were more advanced than those used in government and other industries.

COMPARISON OF TRADITIONAL CHINESE BOOKKEEPING WITH ITALIAN-STYLE BOOKKEEPING

Traditional methods of Chinese single- and double-entry bookkeeping have been discussed by Zhao (1987), Guo (1988) and Lin (1992). However, the internal mechanism of these methods and similarities and differences with Italian-style bookkeeping have not been carefully examined. Lin (1992) alleged: 'Although there were several versions and recording techniques, the underlying principles of Chinese double-entry bookkeeping were similar to the Italian-style bookkeeping developed in Europe at about the same time' (p. 119).

Unfortunately these similarities have not been addressed and no corroborating evidence has been provided. Given our observations, there are five significant differences between the Chinese and Italian styles of bookkeeping.

1. *Recording symbols.* Receipt and Disbursement were used as recording symbols rather than Debit and Credit.
2. *Accounts classification.* The accounts were classified into Receipt (*Jin*), Payment (*Jiao*), Keeping (*Cun*) and Owing (*Gai*) rather than Assets, Liability and Owner's Equity. This classification is based on the results of activities, not on the transaction contents. As shown in the illustrative example above, silver (cash at bank) can be either classified as an Owing or Keeping account, depending upon the circumstances.

EVOLUTION OF CHINESE BOOKKEEPING

TABLE 4

COMPARISON OF TRADITIONAL CHINESE BOOKKEEPING WITH ITALIAN-STYLE BOOKKEEPING

Accounts classification	Traditional Chinese receipt–disbursement double entry		Italian-style debit–credit double entry	
	Receipt	Disbursement	Debit	Credit
Receipt (<i>Jin</i>)	Increase		Decrease	Increase
Payment (<i>Jiao</i>)	—	Increase	Increase	Decrease
Keeping (<i>Cun</i>)		Increase	Increase	Decrease
Owing (<i>Gai</i>)	Increase		Increase	Increase

3. *Basic equation.* Under the Chinese method, the equation is:

$$\text{Receipt (Jin)} - \text{Payment (Jiao)} = \text{Keeping (Cun)} - \text{Owing (Gai)}$$

(Four Feet account).

$$\text{Keeping (Cun)} = \text{Owing (Gai)} \pm \text{Profit or Loss (lishi)} = \text{Owing (Gai)} \\ + \text{Receipt (Jin)} - \text{Payment (Jiao)} \text{ (Four Feet account)}$$

These are different to equations under the Italian style:

$$\text{Assets} = \text{Liabilities} + \text{Owner's Equity}$$

4. *Recording Principle.* The recording principle was as follows: Receipt and Disbursement must appear at the same time and the respective amounts must be equal.

As shown in Table 4, transactions recorded in the receipt (*Jin*) and Owing (*Gai*) accounts are always on the Receipt side; on the other hand, transactions recorded in Payment (*Jiao*) and Keeping (*Cun*) accounts are always on the Payment side.

Only increases in *Jin*, *Gai*, *Jiao* and *Cun* are recorded. If there is a decrease in these accounts, for example, sales returns, then this may be regarded as a decrease in Receipt (*Jin*), and the following journal entry is prepared:

Receipt: silver from on hand (Owing account)
Disbursement: silver on inventory (Keeping account)

Therefore, a decrease in *Jin* can be recorded as an increase in Keeping account and a sales return is treated as a purchase.

5. *Underlying theory.* The underlying theory of the originality of Italian-style bookkeeping is that of personification. Karl Käfer (1996) pointed out:

The personification of accounts lies at the very root of double-entry. The first accounts were opened to debtors and creditors. Their headings, 'shall give' (*deve dare*) and 'shall have' (*deve avere*), were then transferred to accounts for merchandise, for expenses, and finally to all accounts (Peragallo, pp. 7, 22, etc.). It was easier to

explain the difficulties of booking transactions if one viewed cash or merchandise as if they were persons . . . During the early expansion of double-entry into the offices of the merchants and the other commercial nations, this feature was always regarded as a characteristic of the Italian method of accounting. (pp. 8–9)

However, the basic principle of Chinese double-entry bookkeeping is that cash inflows should be equal to cash (silver) outflows: Cash acted as a medium flowing from one account to another. If cash flows out, the Chinese called it 'disbursement' (*Fu*); simultaneously, it should flow into an account which the Chinese called 'receipt' (*Sou*), as emphasized earlier. Receipt and Disbursement must appear at the same time and the respective amounts must be equal.

There is an exception to this principle for transactions related to cash and bank deposits. When cash is received from sales, it is recorded as 'Disbursement: cash [silver] on hand'. When cash is spent on a purchase, it is recorded as 'Receipt: cash [silver] on hand'. This phenomenon can be explained as follows: one has to imagine that there is a cashbox. When cash is received from a sale the cash will flow into that box. This represents a disbursement into the box.

AN ALTERNATIVE RESEARCH PERSPECTIVE

We have tended to follow a cultural approach, under an emerging social consensus, to the development of principles of professional practices (Littleton, 1933; Dewey, 1939). However, there is a view that the introduction of Western accounting practices into China may reflect an argument originally put forward by Foucault. Thus Chinese cultural traditions are to be marginalized by the bookkeeping process whereby accounting becomes a facilitator for change in the interests of Western countries (Rabinow, 1984). The issue can be emphasized with respect to foreign trade. It is a legitimate perspective for understanding developments of accounting practices as a means of change but it is not the perspective adopted here.

Under such a cathartic view of bookkeeping changes as facilitating the marginalization of naturally emerging evolutionary trends, the Four Feet bookkeeping method and the Longmen approach would vanish. They do not comply with current developments. Thus, Western bookkeeping will replace traditional methods. Changes are then argued to be a result of ineffective traditional methods being replaced by a freely available modern technology utilizing double-entry practices.

Bookkeeping is an influential measurement tool. However, it has been argued here that acceptance of its practices remains a consequence of developing social judgments about interpersonal behaviour and associated institutional and professional concepts of accountability. Nevertheless, we acknowledge demonstrated research strengths of the politically orientated alternative. Our view appears to be at variance with authoritarian pronouncements that only debit-credit type bookkeeping will now be used throughout China. However, the proof of this lies in the future. Interpretations in practice, given long-standing traditions governing cultural change in China, may eventually surprise many Western observers.

INTERPRETATIONS

Before any conclusions are drawn, three illustrative questions are offered in order to focus future developments:

1. Why did the Chinese double-entry bookkeeping methods emerge during the Ming and Qin Dynasties, and not earlier or later, for example, in the Tang or Song Dynasties?
2. Why was the evolutionary process from single entry to double entry so slow during the first two to three hundred years of capitalism?
3. Why were the Chinese double-entry frameworks, Longmen and Four Feet, replaced?

Accounting historians may attempt to identify variables which influence the development of accounting practices in certain countries and in certain periods. In earlier years Farmer and Richman (1966) organized environmental characteristics into four major groups. This was in order to understand how a country's cultural (legal, political, educational and economic) influences can direct the development and sophistication of its accounting systems. Aiken and Lu (1993c) classified those variables for the Chinese dynasties, in the manner of the approach suggested by Miller, Hopper and Laughlin's 'New Accounting History' (Miller *et al.*, 1991).

China has had a long-lasting feudal system. During more than two thousand years of that feudal system, the evolution of a unique single-entry bookkeeping framework occurred. It made contributions to world accounting (Guo, 1988). In the late Ming Dynasty there were developments of a commodity economy and concomitant advances in commerce and banking. Economic activities tended to become more complicated with increased capital requirements and the development of complex business relationships. Chinese double-entry frameworks, Longmen and Four Feet bookkeeping, emerged from this amalgam of forces.

Because this development was very slow, the commodity economy itself was not highly developed. Double-entry bookkeeping had still not matured after nearly three hundred years of evolution. It was not used extensively throughout that period. Although the Longmen and Four Feet methods of bookkeeping were used to some extent in the Qing Dynasty, the use of a single-entry framework was the norm in nearly every aspect of the society and economy. Bookkeeping methods in use thus lagged behind those of Western countries.

Chinese feudal society was typical of a mature feudal system in that nothing was changed easily. Thus although capitalism emerged in the late Ming Dynasty, the years from then until the Opium War of 1840 produced only slow evolution. This made trade in commodities uncertain and also caused great variation in the economies of different geographical areas. In such a culturally diverse environment, accounting did not benefit from significant innovation. From a cultural perspective, people in China, including government officials, frowned upon commerce. Accounting was accepted to be a non-skilled service activity. Until the twentieth century China had little literature about accounting. It did not encourage professional teaching of

accountancy and hence accounting experience was not converted into a formal body of knowledge. Consequently, in the course of three hundred years the transition from single-entry to double-entry bookkeeping remained incomplete.

After the first Opium War, Western bookkeeping methods were recognized and used in some industries and commercial banks. However, under Chinese cultural and economic conditions, traditional bookkeeping had long been in use. Accounting reforms of the 1920s were aimed at making Western bookkeeping methods more significant to the Chinese people as well as outsiders. Such accounting innovations sought to capture the benefits of both Western bookkeeping and traditional Chinese methods. However, this endeavour ultimately failed. Chinese double-entry bookkeeping systems remained in a primitive state and Western double entry is recognized to be superior to Chinese double-entry bookkeeping because:

1. The Chinese accounting system was not comprehensive. Although transactions were recorded in *Cao Liu* when they occurred and then posted to *Zong Qing* according to *Cao Liu*, the system lacked a reasonable link between all accounts. It was therefore simple to make mistakes and difficult to find them.
2. The classification of items and sub-items was also not systematic. Chinese accounting did not classify the contents of business transactions and the appearance of items under different headings led to lack of completeness in the accounting records.
3. The forms of the ledger and journal were too simple to reflect adequately the nature of the complex business transactions that became the norm.
4. The making of ledger entries was complicated. Because there was no journal the actual form of the ledger was simple, with different kinds of transactions being recorded in the same place, it was difficult to post between *Cao Liu*, *Xi Liu* and *Zong Qing*. Furthermore, there was no settled bookkeeping model. Over a long period, accountants used different methods to express the same ideas and events.

Speculations

All these impediments contributed to the decline of Longmen and the Four Feet bookkeeping methods. However, the evolution of bookkeeping in China from single entry to double entry has been observed in this review. Features of Chinese single- and double-entry bookkeeping have been examined. Influences on evolutionary process have been analysed critically. Bookkeeping, as an important tool of accounting, can be influenced by many events, including the present trading demands between China and the rest of the world. Notwithstanding such pressures, Chinese accounting will retain some special features in line with its own economic and cultural norms. Conditions of the past can be a guide to the future. The observed external emphasis on efficiency and international compatibility may provide little guidance to cultural understanding. There are intrinsic processes reflecting intimate cultural and educational standards of the community itself. These have been seen to sustain parochial attitudes over long periods. However, at the margin, there is little doubt that the influence of Western accounting firms will develop the

growing area of CPA professionalism. Such an intrusion should not discount deeply held cultural beliefs and traditions. These may continue to flourish in China. It is these habitual customs which could guide the growth of accounting and bookkeeping principles in the body of the society. Customers might create problems for achieving the goal of harmonization of accounting practices. However, computerized bookkeeping may lead to longer term standardization of Chinese accounting practices as a whole.

REFERENCES

- Aiken, M., and W. Lu, 'Chinese Government Accounting: Historical Development and Current Initiatives', *British Accounting Review*, June 1993a.
- , 'Perception, Culture and Research Method in Accounting History: Its Evolution in Modern China', *Accounting History*, May 1993b.
- , 'Historical Instances of Innovative Accounting Practices in the Chinese Dynasties and Beyond', *The Accounting Historians Journal*, December 1993c.
- Aiken, M., W. Lu, and X. Ji, 'The New Accounting Standards in China: A Critical Analysis', *International Symposium on Chinese Accounting and Financial Management*, University of Lancashire, Preston, U.K., March 1994.
- Cai, X.-Y., *Lian Huan Zhan Bu* (Chinese), 1905.
- Chatfield, M., *A History of Accounting Thought* (Rev. Edn), Huntington, 1977.
- de Roover, R., 'The Development of Accounting Prior to Luca Pacioli According to the Account-Books of Medieval Merchants', *Studies in the History of Accounting*, Richard D. Irwin, 1956.
- Dewey, J., *Experience and Education*, Collier Books, 1939.
- Eberhard, W., *A History of China* (2nd edn), Routledge & Kegan Paul, 1960.
- Farmer, R., and B. Richman, *International Business: An Operational Theory*, Richard D. Irwin, 1966.
- Fu, P. Y., *A Study of Governmental Accounting in China: With Special Reference to the Song Dynasty*, PhD Dissertation, University of Illinois at Urbana-Champaign, 1968.
- , 'Government Accounting in China During the Chou Dynasty', *Journal of Accounting Research*, Vol. 9, No. 1, 1971.
- Gao, Z. Y., *The General History of Chinese Accounting* (Chinese), Beijing Chinese Financial and Economic Press, 1985.
- Guo, D. Y., 'The Historical Contributions of Chinese Accounting', *Collected Papers of the Fifth World Congress of Accounting Historians*, The University of Sydney, 1984.
- , *The History of Accounting Development* (Chinese), Chinese Broadcasting and Television University Press, 1986.
- , *The History of Chinese Accounting Development* (Chinese), Chinese Financial and Economic Press, 1988.
- Hall, R. O., *The Chinese National Banks, from Their Founding to the Moratorium*, Berlin (s.n.), 1921.
- Holzer, H. P., *International Accounting*, Harper and Row, 1984.
- Hsu, I. C. Y., *The Rise of Modern China*, Oxford University Press, 1975.
- Ji, X. D., and W. Lu, 'Chinese Accounting Reform: Looking Back and Forward', *Chinese Economy in Transition*, 1992 Annual Conference of the Chinese Economic Association, University of Adelaide, Adelaide, Australia, 12-13 November 1992.
- Jong, H. H., 'The Traditional Accounting System in the Oriental Countries', *The of Accounting Historians Working Papers Series*, Vol. 2, 1979.
- Käfer, K., *Theory of Accounts in Double-Entry Bookkeeping*, Center for International Education and Research in Accounting, University of Illinois, 1996.
- Li, C. M., *The Accounting System of Native Banks in Peking and Tientsin*, Garland, 1982.

- Li, S. K., *Chinese Modern History* (Chinese), Taipei, 1961.
- Lin, Z. J., 'Chinese Double-Entry Bookkeeping Before the Nineteenth Century', *The Accounting Historians Journal*, Vol. 19, No. 2, 1992.
- Littleton, A. C., *Accounting Evolution to 1900* [1933], Russell & Russell, 1966.
- Lu, W., *Accounting Development in China During the Modern Era*, Masters thesis, La Trobe University, 1992.
- McAleavy, H., *The Modern History of China*, New York, 1967.
- Meng, S., *History of the Ming Dynasty* (Chinese), Taipei, 1957.
- Miller, P., T. Hopper, and R. Laughin, 'The New Accounting History: An Introduction', *Accounting, Organizations and Society*, Vol. 16, 1991.
- Ministry of Finance, 'Chinese Accounting Standards for Enterprises', *Accounting Research* (Chinese), No. 6, pp. 7-11, 1992.
- , *Certified Public Accountants Act 1993*, Chinese Economy and Finance Publishing, 1993.
- Nobes, C., *The Development of Double Entry: Selected Essays*, Garland Publishing, 1984.
- Nobes, C., and R. Parker, *Comparative International Accounting*, Prentice-Hall, 1995.
- Pacioli, L., *Summa de Arithmetica, Geometria, Proportionie Proportionalita*, Paganinus de Paganinis, 1494.
- Parker, R. H., 'The Scope of Accounting History: A Note', *Abacus*, March 1993.
- , *Papers on Accounting History*, Garland Publishing, 1984.
- Peragallo, E., *Origin and Evolution of Double-Entry Bookkeeping*, American Institute Pub. Co., 1983.
- Perera, M. H. B., *The Relevance of International Accounting Standards to Developing Countries*, Research Monograph, 85-8, School of Financial Studies, University of Glasgow, 1985.
- Rabinow, P., *The Foucault Sampler*, Penguin Books, 1984.
- Su, K. M., *Modern China: A Topical History* (Chinese), New World Press, 1985.
- Wei, Z. X., *Chinese Bookkeeping Methods* (Chinese), Chinese Financial and Economic Press, 1984.
- Xu, Z. Y., *An Outline of Chinese Accounting Reform* (Chinese), 1933.
- Yamey, B. S., *The Economics of Future Trading: Selected Reading*, Macmillan, 1978.
- , *Further Essays on the History of Accounting*, Garland, 1982.
- Zhao, Y. L., 'A Brief History of Accounting and Auditing in China', in Shanghai University of Finance and Economics and International Accounting Development, The University of Texas at Dallas, *Accounting and Auditing in the People's Republic of China—a Review of its Practice, System, Education and Development*, The University of Texas at Dallas, 1987.
- Zheng, X. Z., 'Discussion on When Western Double Entry Accounting was Introduced into China', *Finance and Accounting Correspondence* (Chinese), Finance and Economics University of Central-South China Press, 1986.
- Zhou, Z. H., 'Chinese Accounting Systems and Practices', *Accounting, Organizations and Society*, March 1988.

Accounting History

CALL FOR PAPERS

Accounting in Crises

The contemporary purpose, character and perceptions of a particular craft are often illuminated and elucidated when its pursuit is implicated in a crisis. Social scientists have often considered that the functioning of a technique together with the values and relationships which surround its practice, are most observable when its deficiencies are located as the source of a calamitous event. Discourses also surface when practices are impacted upon by exogenous adversities. Accounting historians have recognised that change in accounting practice and regulation has often been instigated by high profile failures, frauds and ensuing litigation. The role of accounting has also been made visible when the discipline and its practitioners have been perceived as repositories of possible solutions to problems which have emerged during periods of severe economic and military crisis. Total war, for example, has been a catalyst for considerable change in the accounting profession and cost accounting. These changes, in turn, have had consequences for wider organisational and social functioning. The inter-war depression saw accounting feature in the search for solutions to a crisis of capitalism. The nature of accounting and the vocation has also been laid bare at times of crisis within the discipline itself.

The object of this special issue of *Accounting History* is to focus on crisis and change and on crisis and making accounting visible in contemporary contexts. Submissions are sought which explore themes such as:

- The impact of particular crises on accounting development and its practitioners
- Crisis, identity and legitimacy in accounting
- Crisis and causality in accounting history
- Crisis and continuity in accounting history
- Crisis and opportunity in accounting
- Crisis and revelations of the functioning of accounting
- The profession and the management of crisis.

The above list is not intended to be exhaustive and contributions are encouraged which examine accounting in crises in a variety of times and locales. This special issue will appear in November 2000. Submitted papers will be refereed in the usual way.

Submissions (three copies) should be forwarded by **1 February 2000** to:

Stephen P. Walker
Department of Accounting and Business Method
University of Edinburgh
50 George Square
Edinburgh EH8 9JY
UNITED KINGDOM

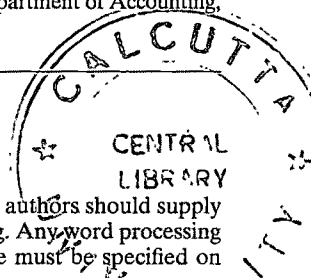
ABACUS has as its objective the publication of exploratory constructive and critical articles on all aspects of accounting and on those phases of the theory and administration of organizations and of economic behaviour generally which are related to accounting, finance and business studies.

Manuscripts should be sent to the Editor and will be considered for publication only if accompanied by a submission fee of U.S.\$40.00. The submission fee is waived if the author or a co-author is a personal subscriber to the journal. The general layout and style should follow the most recent Style Guide which is printed in the journal from time to time.

Editorial correspondence should be addressed to The Editor, ABACUS, c/ - Department of Accounting, University of Sydney, N.S.W. Australia 2006.

Style Guide to Contributors

1. Submit three copies of manuscript. After the paper has been accepted authors should supply papers as formatted text on disk. The disk copy will be used for printing. Any word processing format is acceptable. The hardware and the word processing package must be specified on the disk.
2. Use opaque quarto paper (207 mm × 260 mm) or A4 (210 mm × 297 mm); double space text; leave adequate (30 mm) margins on both sides.
3. Place name of author in BLOCK capitals above the title of the article. Give author's present position at the foot of the first page, as in this issue.
4. Use footnotes sparingly. Place them at the end of the manuscript, double spaced with an extra line between entries. Number footnotes consecutively throughout the text; use superior numbers without point, thus: '... money'.³ Cite books and articles in the text thus: ... (Jones, 1962, p. 21).
For page reference numbers use p. 21, pp. 423-32, pp. 406-571, but pp. 11-13, pp. 115-19.
5. List books and articles cited in alphabetical order at the end of the manuscript. When listing books and articles use the following forms respectively:
Jones, A., *Depreciation of Assets*, Publisher & Co., 1962.
Morrissey, L., 'Intangible Costs' in Morton Backer (ed.), *Modern Accounting Theory*, Prentice-Hall, 1966.
Revsine, L. and J. Weygandt, 'Accounting for Inflation: The Controversy', *Journal of Accountancy*, October 1974.
Smith, B., 'An Aspect of Depreciation', *The Journal of Accounting*, August 1965.
Do not use brackets; use short titles for publishers unless it is essential to tracing.
6. Underline what is to be printed in italics. Use BLOCK capitals only for what is to be printed in capitals. Use italics and BLOCK capitals sparingly. Use the smallest number of styles for section headings; preferably side headings, in italics.
7. For quotations within the text use only single quotation marks, and double marks for quotes within quotes. Where quotations exceed four lines, indent quoted material three spaces, but do not use quotation marks.
8. Do not use a point in standard abbreviations such as CPA, SEC, but use points in U.K., U.S.A., and similar abbreviations. Date style e.g. 19 February 1966.
9. Use double dashes (—) to indicate dashes in the text, single dashes (-) for hyphens.
10. Use 'z' for such words as capitalize; 's' for the smaller number of words such as advise, analyse, comprise, enterprise (see *Oxford English Dictionary*).
11. Use the simplest possible form for mathematical symbols.
12. Keep tables to a minimum, but do not try to convey too much information, at the cost of simplicity, in any one table.
13. For book reviews use the following form for headnotes:
A. JONES. *Depreciation*, Publisher & Co., London 1966, vii + 212 pp.



A BACUS

A Journal of Accounting; Finance
and Business Studies

CONTENTS

The FASB's Conceptual Framework and Political Support: The Lesson From Employee Stock Options	<i>Haim A. Mozes</i>	141
Towards a General Model of the Reasons for International Differences in Financial Reporting	<i>Christopher Nobes</i>	162
Further Evidence on the Economic Effects of Changes in Loan Loss Provisions on Bank Stock Returns	<i>Paul A. Griffin</i>	188
The Decision Relevance of Cash-Flow Information: A Note	<i>Stewart Jones and Loura Widjaja</i>	204
The Evolution of Bookkeeping in China: Integrating Historical Trends With Western Influences	<i>Maxwell Aiken and Wei Lu</i>	220

